California Journal OF SECONDARY EDUCATION

This Month

- **The GED Tests—Friends or Foes?**
- **East German Youth Decide for Themselves**
- **A New Role for Principals**
- **Current Materials and Events in Mathematics**
- **The Youth Guidance Council**
- **Teacher Recruitment Through a Junior College Course**

A Symposium on

TEACHING CRITICAL THINKING AND PROBLEM SOLVING IN SECONDARY SCHOOLS

VOLUME 31, No. 2 **FEBRUARY 1956**

Symposium Next Month

DEVELOPING ECONOMIC COMPETENCE OF PUPILS IN SECONDARY SCHOOLS

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CONTENTS FOR FEBRUARY

Editorial—American Education in World Perspective 64

The GED Tests—Friends or Foes? *Harry E. Tyler* 66

The Youth Guidance Council of Menlo-Atherton High School, *Eleanor Kellum* 72

East German Youth Decide for Themselves, *Harold B. Erickson* 75

A High School Activities Program Workshop, *Oscar Littleton* 79

Teacher Recruitment Through a Junior College Course, *Ted Gordon* 82

A "New Role" for Principals, *William Plutte* 86

But Who Counsels the Counselor? *George Shaftel* 89

SPECIAL FEATURES

What's Happening in California Secondary Schools, *William N. McGowan* 92

Current Events and Materials in Mathematics, *Dale Carpenter* 97

Next Month a Symposium on Developing Economic Competence of Pupils in Secondary Schools

Symposium:

Teaching Critical Thinking and Problem Solving in Secondary Schools, *Mary Louise Jones* 103

Administrative Policies for Teaching Problem Solving, *Averill M. Chapman* 103

Problem Solving and Critical Thinking in the Tamalpais Union High School District, *Chester G. Carlisle* 105

Problem Solving: Why It Isn't and What It Is, *Richard E. Gross* 108

Teaching Critical Thinking and Problem Solving in the Junior High School, *Don C. Cline* 113

Teaching Critical Thinking in Secondary Social Studies, *John E. Searles* 119

Education for Problem Solving in High School Science, *Robert Stollberg* 121

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EDITORIAL

AMERICAN EDUCATION IN WORLD PERSPECTIVE

Early next fall the *Journal* will feature a symposium on American education as viewed from a world perspective. The selection of this subject is a reflection of the dramatic shift of America from an isolated to a central position in world affairs. Increasing numbers of teachers, research scholars, and students from abroad are coming to work in American schools and many more of us are studying abroad. We must evaluate these experiences so that they may be used as much as possible to strengthen our own school system. We invite teachers and administrators who have traveled and studied abroad or who have had exchange students or teachers in their schools to send to us brief written descriptions of these experiences.

We are especially interested in this problem. Between now and the opening of school next fall we will be traveling around the world, giving attention to educational systems in as many countries as possible. Our longest stay will be in Australia where our children will attend school and we shall conduct intensive studies of the relations between teachers and pupils in secondary school classrooms. From time to time we shall report in these columns some of the aspects of education abroad which we think might have greatest interest for our readers.

Though we have been away from the United States for only a few weeks, already a fact often reported by returning American travelers is becoming abundantly clear: namely, that neither our country as a whole nor our educational system in particular are considered by foreigners as perfect, superior, or even good! The newspaper and radio selection of the small amount of American news reported tends to the sensational and the critical side, as do the questions raised in personal conversation. The dominant tone is negative, yet the criticism is accompanied by the adoption of American ways. For example, in a recent book prepared as a guide by Australian writers for the Queen's visit, it is reported that Sydney is often compared unfavorably with Melbourne because it has become too "Americanized."

Secondary education is in a transitional stage in most parts of the world, just as in the United States. Even while there is a basically critical attitude toward American schools, those abroad are anxious to learn what we are doing and to adopt what they consider useful. The new five-year program for the reform of secondary education in Fiji was headed in much the same direction as are the adjustments we are trying to make in secondary schools in the United States. But just as other peoples are learning from us, so have we much to learn from them. Even in some of the so-called "backward" or "underdeveloped" countries, the approach being taken to

educational reform is instructive. Each country develops a school system that is unique and appropriate for itself, but each also can and should learn from others. This is essential, for the world must come closer together if we are to have lasting peace. We must guard against the tendency to consider ourselves so far "advanced" as to have nothing to learn from the educational systems of other nations.

There is a stirring of interest in educational problems and a growing recognition on the part of leaders in all walks of life that a nation's greatness is directly related to its educational system, and that more thought and resources than ever before must therefore be directed accordingly.

R. N. B.

The GED Tests—Friends or Foes?

By HARRY E. TYLER

Harry E. Tyler is now Assistant to the Director for Research and Development, United States Armed Forces Institute, Madison, Wisconsin, but for many years he was a secondary administrator in California. His last post was as Superintendent of Santa Maria Union High School and Junior College District. Mr. Tyler reports here an extensive appraisal of the General Educational Development Tests which have been administered to over a million military personnel.

April 1942 is a month of real significance in American education for it was during this month that a new and unique educational institution first opened its doors in Madison, Wisconsin. This was the Army Institute that since has become the United States Armed Forces Institute (USAFI) and is now the largest educational institution in the world offering courses by correspondence. Significantly related to the Army Institute was the genesis of another educational venture which also began in April 1942. "In April 1942, a special committee of the American Council on Education recommended to the sub-committee on education of the joint Army and Navy Committee on Welfare and Recreation that success in the Army Institute correspondence courses be appraised in terms of skills, attitudes, and knowledge achieved by the student; that the Army Institute provide opportunity for soldiers, not registered in courses but with comparable training experience, to take appraisal tests and receive proficiency ratings if they could achieve a satisfactory standing in such tests; and that carefully constructed appraisal tests be used to determine the educational significance of skills acquired through various types of war experiences."[1]

As a result of the special committee's recommendation a contract was entered into with the University of Chicago in May of 1942 to establish a special examinations staff for the Army Institute. This staff engaged in developing three major types of examinations, including the General Educational Development Tests to determine the educational level at which a student might resume work on his return to school or college.

The tests were developed by an operating group under the direction of Dr. Ralph W. Tyler, then of the University of Chicago, and were standardized on the high school level by giving them to some 35,000 graduating high school seniors in the spring of 1943.

The first form of the General Educational Development Tests (Form

[1] Cyril O. Houle, Elbert W. Burr, Thomas H. Hamilton and John R. Yale, *The Armed Services and Adult Education*, American Council on Education, 1947, p. 94.

A) was made available for administration in 1943. From the records it is estimated that well over a million GED Tests have been administered to military personnel in the past ten years. GED Tests have also been administered to veterans and non-veterans by civilian institutions and agencies. Probably no instrument of evaluation in the history of education has been so widely used and accepted as have the tests of General Educational Development. The imprint that these tests have made upon the educational experiences of hundreds of thousands of young men and women and the many thousands of educational institutions is impossible to measure. After ten years of use it is time that educators appraise these unique evaluative instruments—the GED Tests. Are the GED Tests friends or foes of secondary education?

Within ten years after the Tests of General Educational Development were first used in the field, the State Departments of Education in all forty-eight states, the District of Columbia, and the Territories of Alaska, Hawaii, Puerto Rico, and the Canal Zone, had adopted policies and practices regarding the accreditation of service experiences. The practices and policies relative to the granting of credit for military experience will vary in detail from state to state and in some states from high school to high school. Nevertheless, the GED Tests as evaluative instruments are recognized today in hundreds of secondary schools and in many post-high school educational institutions.

What are these GED Tests that have made such an impression in secondary education in so short a time?

Actually, they are too well-known by secondary school educators to require much elaboration. It should be noted, however, that these tests represent a different method of evaluating educational experience. When Messrs. Tyler and Lindquist[2] were instructed to develop tests, they were directed to develop tests which would "give a general picture of educational competence without focusing either on a specific course alone or on a single field." The tests were designed primarily for the use of civilian educational authorities in the placing of veterans so as to evaluate objectively their educational development, formal and informal. The high school level GED battery consists of five tests, each one measuring an area of importance in general academic high school education:

Test 1: *Correctness and Effectiveness of Expression;*
Test 2: *Interpretation of Reading Materials in the Social Sciences;*
Test 3: *Interpretation of Reading Materials in the Natural Sciences;*
Test 4: *Interpretation of Literary Materials;* and
Test 5: *General Mathematical Ability.*

At various times during the ten years that the GED Tests have been used, studies of their effectiveness have been made. Most of these studies

[2] Dr. E. F. Lindquist, State University of Iowa, collaborated in the project.

were undertaken in schools or colleges for the information of the particular school concerned. Other studies, such as that made by Dressel and Schmid in 1951, were more comprehensive.[3] However, none of them was complete enough to answer adequately the question of success or failure in the purposes of the tests. Likewise, no comprehensive study had been made to ascertain whether or not persons admitted to employment on the basis of scores in GED Tests in lieu of high school education had been successful. Now in the findings of the study completed by the University of Chicago under the direction of Dr. Ralph W. Tyler will be found some of the answers as to whether or not the tests of General Educational Development have been friends or foes of secondary education.

The findings of this study are essential to the direction of USAFI in the years ahead. They are also of such a nature as to be of vital importance to all those who are charged with the responsibility of directing the program of high school and post-high school education in the United States. USAFI will use the findings in planning its future program of evaluation instruments. Civilian educators should use the findings to determine their opinions about the Tests of General Educational Development and to implement their policies concerning the admission of veterans to their institutions and the evaluation of their educational experiences while in the military services. Here are some of the findings.

How widespread is the use of the GED Tests (High School Level)?

All but three states—New Jersey, North Carolina and Indiana—use the high school level GED Tests in the issuance of high school equivalency certificates or diplomas for servicemen and veterans. Forty-seven states and three territories now recognize in some manner the GED Tests in connection with the granting of diplomas or certificates of equivalency.

On January 22, 1954, a questionnaire was sent to all of the 571 Veterans' Testing Service agencies asking for a detailed report on the GED Testing activities over the previous two years to determine the civilian use of the tests. Four hundred and sixty-nine of the 571 agencies responded in time for statistical analysis in the evaluation report. This analysis shows that there has been a 9 per cent increase in high school GED testing over the past two years. The best estimate would be that, at the present time, about 40,000 high school level GED Tests are being administered in civilian agencies this year of which approximately 25,000 are being administered to veterans, 15,000 to non-veterans.

A survey was also made of a random sample of 1,000 high schools and 200 colleges to determine the extent to which they were using the various USAFI tests. Eighty-six per cent of the high schools reported that they were accepting the results of GED Tests as a basis for granting a high school diploma or an equivalency certificate.

[3] P. L. Dressel, and J. Schmid, *An Evaluation of the Tests of General Educational Development*, American Council on Education, Washington, D.C., 1951.

How successful or unsuccessful have persons been who were admitted to post-high school institutions on the basis of the results of GED tests?

Of the many thousands who have attained successful scores on the high school level GED Tests most of them have put their new status to two kinds of use. Some have found jobs which would not otherwise have been available to them. Another group has used the tests as a stepping-stone to educational advancement. These GED students have been admitted in substantial numbers to many colleges and universities throughout the country. This Evaluation Study was concerned with the achievement of students admitted to college on the basis of educational achievement demonstrated on the GED Tests and with how their achievement compared with that of students admitted on the basis of their completion of a regular high school education. In considering this report, it is well to keep in mind the heterogeneous group consisting of veteran non-high-school graduates. This group includes persons of all levels of intelligence; persons with widely varying interests, skills, and ambitions. Most of these persons have been away from school for a number of years. The reasons for which they left school are also varied.

Since withdrawing from high school these persons have had extensive opportunity for educational development both in civilian and military life. Although these experiences seldom paralleled the formal learning experiences which our high schools offer, there are many reasons to believe that for some at least, these experiences advanced the general educational level of the individual to or beyond the level achieved by many high school graduates. In an attempt to arrive at a nationwide description of the post-high school educational achievement of students admitted on basis of GED Test scores, data were collected in several stages and from several sources. Formal studies which were reported either in journals or in unpublished theses have comprised the major sources of the data. In addition, a brief, questionnaire was sent to every college and university in the country. This questionnaire inquired into the availability of data on the students admitted on GED scores even if no prior studies had been made. Some schools responded with data immediately; others indicated a willingness to do so. As the analysis of data began it became necessary to send out a second questionnaire to those schools who had previously indicated a willingness to supply the data. In order to widen the scope of the data these questionnaires were sent to a greater number of the small schools than to the larger institutions.

All of the evidence presented led to two important conclusions. *First, an assessment of the over-all success of GED matriculants at a relatively large number of different institutions established the fact that substantial portions of these students were successful in college.* Not only did almost half of them complete one year of college with academic averages equal to or above the minimum level required by the college for graduation, but over 20 per cent of them actually completed degree programs. Second,

when they were compared with regular high school graduates in achievement it was found that the GED group had not done quite so well as those who had completed high school in the usual way. *But the differences were surprisingly small.*

The findings of this study regarding the success of persons admitted to post-high school institutions on the basis of scores made in the high school level Tests of General Educational Development would indicate that these tests have been friends of secondary school educators. The challenge of the high school drop-out is one that has given considerable concern to secondary school people. The GED Tests have offered one means of meeting this problem for those who have entered the military services.

How successful or unsuccessful have persons been who have been admitted to industrial employment on the basis of GED tests as compared to those admitted as regular high school graduates?

More than three-fourths of the large employers of high school graduates will accept veterans who demonstrate the equivalence of high school graduation on the basis of GED Test results. A survey was made to determine whether persons who were accepted in industrial employment on the basis of the test results, and had been assigned jobs which usually require high school graduation, were able to carry them out successfully—as successfully as those who actually graduated from high school. Studies were made at the Chrysler Corporation, Illinois Bell Telephone Company, The Peoples' Gas, Light and Coke Company, Tennessee Coal and Iron, The Davenport Mills, R. R. Donnelly and Sons Company, and The Pacific Gas and Electric Company. In all but one of these industrial concerns, the survey indicated that the employees accepted on the basis of having passed the GED Tests in lieu of high school graduation did as well as regular high school graduates. In the one exception where the GED qualified apprentices did not measure up to regular high school graduates, part of the differences was clearly attributable to the fact that the company did not maintain high enough standards in terms of test performance for the GED apprentices.

How successful were persons admitted to public employment as compared to regular high school graduates?

Surveys were made in the Detroit Police Department, Chicago Park District, Battery State Hospital, San Francisco Police Department, the Los Angeles City Schools, and the San Francisco Fire Department. Without exception these areas studied in terms of all of the criterion measures of success used to compare the GED students with high school graduates, no significant differences between the two groups appeared. The study gave further evidence that the GED Tests do, in fact, measure general high school equivalence as far as public employment is concerned in those areas requiring high school graduation.

Thus, both in industrial and public employment in the areas that were

surveyed, the results give evidence that the GED Tests are friends of secondary education and that the policy of recognizing scores made has been successful.

The testing program of the United States Armed Forces Institute has now been in operation more than ten years. Thousands upon thousands of men and women in the Armed Forces have taken USAFI tests. Many thousands of them have received recognition for having completed the high school level GED Tests by being given high school diplomas, equivalency certificates, or by being admitted to post-high school institutions and civilian employment. Many more thousands have advanced themselves in the military services by reason of the scores made on these tests. First begun as an experiment in evaluating the general educational development of persons whose formal education had been limited, the GED Tests now have become firmly established in the total educational picture of America. Of course the high school level GED Tests do not measure all that a high school may seek to develop in its students in a regular high school curriculum. The GED Tests sample some of the major intellectual skills, knowledge and understanding largely related to the major academic fields that are expected to be retained. As far as the major academic areas of education on the high school level are concerned, the GED Tests give some measure of competence that is equivalent to those of persons regularly graduated from high school. Many of the persons who have taken these tests would be lost to education without them. Many thousands have been encouraged to continue their education and a large number of them have succeeded.

The Evaluation Study of USAFI Evaluative Instruments has objectively indicated that the Tests of General Educational Development (high school level) are really friends of the secondary schools of the United States. These tests have helped implement the educational philosophy that public education should provide educational opportunities for "all of the children of all the people." For the youth who have left high school and entered the armed forces the GED Tests make it possible for them to continue their education after they have reached sufficient maturity to make use of their opportunities. These friends of secondary education—the GED Tests—should receive the whole-hearted co-operation and enthusiastic support of the secondary school educators of America.

THE THREE R'S AND THE FOUR P'S

Education fails unless the Three R's at one end of the school spectrum lead ultimately to the Four P's at the other—Preparation for Earning, Preparation for Living, Preparation for Understanding, Preparation for Participation in the problems involved in the making of a better world.

—Norman Cousins

The Youth Guidance Council of Menlo-Atherton High School

By ELEANOR KELLUM

Eleanor Kellum, Vice-Principal and Dean of Girls of Menlo-Atherton High School, describes an effective Youth Guidance Council at Menlo-Atherton High School. Mrs. Kellum is a graduate of Pomona College and received the Master of Arts degree at Stanford University in 1950.

This organization is not unique. The Office of the San Mateo County Superintendent of Schools reports that most secondary schools in San Mateo County have a similar youth council. This report relates only important organizational data and procedures which underlie the success of this venture at Menlo-Atherton High School.

Menlo-Atherton now in its fourth year of existence has a student population of approximately 1,650. The Youth Guidance Council, started in the fall of 1951, has, from its inception, been an important factor in dealing with the problems of youth, especially those who evidenced lack of adjustment. The council is a device which permits us to reach a well thought-out decision and plan a course of action in a relatively short period of time. It has enabled those responsible for the guidance of students to obtain quickly the thinking, advice, and recommendations of other agencies concerned with particular problems, as well as to secure the data concerning previous attempts at adjustment. The council permits an early attack on a developing problem. Our close association as we work on common problems dissolves all formalities between members of various agencies. Thus, conferring via the telephone or around the council table becomes a process of old friends talking together.

The council is composed of the Vice-Principal, Dean of Girls, Dean of Boys, Registrar, Head Counselor of the High School, District Director of Welfare and Attendance and Student Personnel Services. The grammar schools whose students become our freshmen are represented by their principals. The law enforcement agencies send a member from the County Sheriff's office, the Menlo Park Police department and the Atherton Police department. There are at least two members from the Probation department, one from the Social Welfare department, and two from the Guidance department of the County School Superintendent's office. Meetings are held once a month and are of one hour duration. The officers include a chairman and a secretary. Just prior to a meeting a letter is sent to the individual members reminding them of the date of the next meeting and

indicating the agenda. An item or case may be placed on the agenda at the request of any member. Minutes are transcribed, stamped confidential, and mailed to members following each meeting.

The factors which have materially affected the success of the council are:

1. The manner of conducting the meeting:

   Our meeting begins promptly at 9:30 and ends promptly at 10:30, not ten or fifteen minutes later. It is simple to start a meeting on time, but it takes constant maneuvering on the part of the chairman to keep discussion moving in a forward direction and *ending* with a recommendation. If permitted, discussion can become valueless and time consuming. It is not always possible to determine a complete plan of action in so limited an amount of time, but immediate steps can be indicated. The order of each meeting is similar:

   a. Self introduction of members
   b. The acceptance of, or correction of, the minutes (these are not read during the meeting as each member has previously received his copy).
   c. Timely reports of cases discussed in past meetings
   d. Discussion of new cases and problems according to the agenda

2. The exhaustive gathering and organization of data prior to presentation of a case, including:

   a. Student's age and year in school
   b. Academic record
   c. Test results
   d. Attendance record
   e. Present academic program
   f. Summary of teacher observations and anecdotal records
   g. Report of family status and conferences
   h. Report of conferences with student
   i. Psychologist reports
   j. Other pertinent data

3. Case follow-up:

   A case once presented is periodically re-considered until adjustment has been effected or until the student has been removed from the jurisdiction of the school.

4. The placing of emphasis upon the consideration of youth problems as well as specific case studies

   Some of the problems discussed in the past include:

   a. High school placement of court wards from other counties

b. Big Brother movement

c. Hot rod clubs.

5. The organization and completeness of the minutes:

We have found the following form most useful:

Jane Doe: Since the last meeting the school nurse has talked with the family physician, Dr. ——, who indicated he did not believe the illness of Jane's mother was sufficiently serious to require Jane to interrupt her present educational program. Miss —— reported Social Welfare was able to continue giving financial assistance only as long as Jane remained in school. Mr. ——, school psychologist, indicated Jane was continuing to make progress, etc. ——.

John Doe: This case is not new to the Council. We have considered the case of John's older brother, Jim, many times before. The same pattern of behavior is being repeated by John. John is fourteen years old, is in the eighth grade at —— school. He was taken out of the home about two years ago and sent to live with a grandmother, etc. ——.

Susie Que: Probation reported that Susie was made a ward of the Court and will be released to the custody of her brother who is living in another county, etc. ——.

We feel this form makes a subsequent referral to a case a simple processs for a council member.

6. An annual summary of the numbers of problems, cases and present status of each

7. The faithfulness and friendly co-operation of all members. An appreciation for the attitude, the time and effort expended by each member of the council cannot be expressed in a few words. But the helping hand thus extended by the representatives which form our Youth Council acts as a positive and extremely valuable guidance force at Menlo-Atherton High School.

CAN WE AFFORD BETTER SCHOOLS?

"Last year we Americans spent $7 billion on education. But during the same year we spent $5.25 billion on tobacco, $10 billion on automobiles, $7 billion on gasoline and oil, $2.25 billion on tires, tubes and parts, $3 billion on auto repairs, $1.25 billion on motion pictures, $2 billion on radios and television sets . . . And there was more money spent on beer, wine and liquor last year than on schools!"

—Dr. Frederick M. Raubinger
New Jersey Commissioner of Education

East German Youth Decide for Themselves

By HAROLD B. ERICKSON

Dr. Harold B. Erickson spent a year as educational advisor to the United States Army in Frankfurt, Germany. Later, he returned to make a detailed study of secondary education in East Germany. This article reports some of his findings.

The degree to which Soviet propaganda is successful with students in Soviet occupied countries is of compelling interest to the people of the United States. This consideration led to a systematic examination of Soviet efforts in East Germany during the summer of 1952. An analysis of this information may indicate in some degree how young people react to Soviet propaganda in occupied countries.

The evidence showed that students discriminated in their acceptance and rejection of information even though compelled to attend schools patterned after the Soviet schools, and compelled to see and hear a continuous barrage of Soviet-Russian propaganda via textbooks and classroom teaching. The findings, as obtained by interviews with refugee East German teachers and students, revealed that neither the acceptance by students of Soviet-Russian political philosophy nor of the anti-American propaganda could be considered very high. There was evidence that only a small percentage of East German students between the ages of thirteen to eighteen years accepted the communist point of view. Further, there was indication that less than half of this student group accepted anti-American propaganda.

Textbooks on various subjects used in East German schools were collected and reviewed. For the publication period under consideration, 1950–51, the Soviet Union and those countries under its influence were portrayed in a most favorable manner, while the West, and particularly the United States, was portrayed in a most unfavorable manner. Repeatedly, the United States was characterized in these East German textbooks as a degenerate, greedy, and dangerous country. This portrayal was, of course, in keeping with Soviet Russian dogma that capitalistic systems are, by their very nature, lower on the scale of social organization and therefore inferior.

One typical eighth grade history textbook, used in all East German elementary schools during the school year 1951–52, was carefully analyzed. This *Lehrbuch*,[1] entitled, "Textbook for the Study of History" is an

[1] *Lehrbuch fuer den Geschichtsunterricht, 8. Schuljahr.* Berlin/Leipzig: Volk und Wissen Verlag, 1951. (Abbreviated in further references as, *Lehrbuch, 1951*).

acknowledged translation of a Russian textbook of similar grade. The analysis included a classification of each paragraph in the book under theme headings.

The class struggle was the principal theme in at least 44 per cent of the paragraphs contained in the *Lehrbuch, 1951.* Capitalism, in general, and specifically capitalism in the United States, was disclosed as disreputable and aggressive; this theme was expounded in 32 per cent of the paragraphs. A presentation of the advantages of the class struggle and the favorable characteristics of the Soviet Union and the "People's Democracies"[2] covered the remaining 24 per cent of paragraphs.

The world was described as being divided into a "peace" and a "war" camp. The United States, depicted as being in the "war" camp, emerged as a threatening force on the world scene, and as a nation opposed to the common good. It was pictured as following a well-planned program of world exploitation, and as having no moral scruples against deceit and brutality. The analysis of *Lehrbuch, 1951,* as well as of other East German history texts, demonstrated that they could not be considered textbooks of history; on the contrary, they were clearly instruments of psychological warfare designed to promote antagonistic attitudes toward the United States and western democracy.

When East German school journals *Paedagogik, Die Neue Schule,* and "Directives from the Ministry of Education" were examined, it was evident that heavy reliance was placed upon Russian educators, Russian educational philosophy, and Russian methodology in education. Soviet education stood alone as the model for East Germany, as indeed it was for all the so-called "progressive people." It was also clear that these publications contained the same instructional content and points of view as were revealed by the textbook analysis.

One hundred East German refugees (fifty-four teachers and forty-six students) were interviewed in various parts of West Germany. Their statements substantiated the findings of the foregoing analyses. In the opinion of these refugees, the educational program in East Germany was generally unsatisfactory from the point of view of both students and teachers. Many unfavorable characteristics of the school were pointed out. There was high agreement among and between teachers and students that there was: (1) an excessive amount of political interference in the school system; (2) a highly centralized school system permitting no academic freedom and isolating students from contacts with the Western world; (3) discrimination based on political points of view; (4) a school climate which encouraged fear, suspicion, and mistrust, and which caused many emotional conflicts among teachers and students; and (5) a curriculum designed to promote a political ideology with no tolerance for different points of view. This political ideology had for at least the past four years pre-

[2] "People's Democracies" refers to those countries which are within the Soviet Union's sphere of influence. The countries usually referred to in this way are the following: Poland, North Korea, Romania, Czechoslovakia, Hungary, Bulgaria, and Albania.

sented the West (particularly the United States) as corrupt and warlike and as an enemy of East Germany and of the German people.

In spite of this long-term and all-embracing instructional program designed to produce a definite anti-western and anti-American point of view, no sizable number of students appeared to have accepted this point of view. Eighty-one interviewees were asked for their own estimate of the percentage of communist believers[3] among East German students from the ages of thirteen to eighteen years inclusive. The average for this estimate of believers was 16 per cent. A high percentage of these interviewees, it was noted, qualified their estimate by commenting on the difficulty which obtained in ascertaining the true feelings of East German youth under the prevailing adverse circumstances. However, the general reliability of the interview responses and the narrow range into which estimates fell demonstrated a certain face validity in the estimate.

According to the interviewees, a majority of students and teachers disliked the pressure-tactics of the East German government as well as the ideology it prescribed. The alternative to the "acceptance" of the school program was hard and unrewarding. Hence, students might be forced to pretend to accept the school-government program while in reality they might detest it. Thus, in order to participate in the activities which youth enjoy and also to protect their later job possibilities, most students belonged to the "Free German Youth" organization and participated in other communist functions.

While there was more acceptance of the anti-American propaganda than there was acceptance of the whole communist program for Germany, there was generally high agreement among those interviewed that a majority of students did not accept either. The reasons for this non-acceptance, according to those interviewed, were: (1) the chances, even though few, to compare propaganda with fact by a trip to West Berlin or by a letter from West Germany, (2) the unsatisfactory conditions of life under the East German government and the Russians, and (3) the weariness and disgust with the incessant propaganda in school, government, radio, and press.

Conclusions

1. Successful indoctrination in school is not easy. There are many factors to be considered. The school in East Germany, as elsewhere, is only one of the many influences acting upon youth.

2. Young East Germans are not inevitably drawn to communism even though they may, for a number of years, come into close contact with persons and material promoting this ideology.

3. One of the major inferences to come out of this study is particularly

[3] A believer was defined as one who accepted the official communist dogma as taught in school; and who accepted the Oder-Neisse line as an acceptable German-Polish boundary, and who believed the Soviet statement that all German war prisoners, except a few war criminals, had been returned to Germany.

pertinent to the United States. That is, despite the fears of those in this country who believe that American youth may be irresistibly drawn to communism by the reading and studying of material containing communistic ideas, we have evidence here that the youth of Germany while in constant association with this material actually resist it when resistance is not only difficult, but hazardous. Some would protect all American youth by prescribing their reading material, by forbidding their discussion of vital issues, and by restricting their communication with youth in certian countries. Such thinking, it would appear, overestimates the appeal of Russian-communism and underestimates the appeal of a free society. Such thinking also reflects adversely upon the discriminating ability of youth and strongly suggests a disbelief in democratic thought. A cardinal principle in democratic thought asserts that man can make acceptable decisions and can govern himself if given the opportunity to learn the facts and make comparisons.

4. It is an objective of the Russian-communists to discourage and to destroy international understanding. Through fear and misrepresentation they desire to subvert people and to isolate and weaken individual countries. The Russian-communist program is most effective when a people can be kept isolated, fearful, and deceived. The study reveals that even when there is only meager opportunity for comparing the realities of the communist program with the facts of Western democracy, the communist program is widely rejected.

Since Western democracy has such a strong appeal to youth, it is incongruous to weaken its appeal by limitations, restrictions, and fear, at the very point where Western democracy is the most appealing, i.e., the freedom to discuss issues, to communicate, to make comparisons, to make choices. Further, because communication and comparison are necessary components for intelligent choices, it is reasonable to believe that it would be wise for all Americans to explore every possible means which would serve to open and maintain lines of communication with individuals of all nations. We need not, and indeed should not, fear interaction with other people, but we should fear isolation from other people. The one encourages respect, understanding, and tolerance; the other encourages disrespect, misunderstanding, and conflict.

THIS BUSINESS ABOUT JOHNNY AND HIS READING

A portfolio of eight timely reprints from national magazines and other sources has been prepared to give you up-to-date information on the subject. Authors include: reading specialists Paul Witty and Nila Banton Smith; educators Arthur F. Corey, James M. Spinning, and Bernice E. Leary; education editor Ruth Dunbar; and writer John Hersey. $1.00 per portfolio from the NEA National School Public Relations Association, 1201 Sixteenth Street, NW, Washington 6, D.C.

A High School Activities Program Workshop

By OSCAR LITTLETON

Teachers and administrators in many California high schools have been stimulated and even inspired by the summer work shops. Here they identify and attempt to solve real problems they face during the school year. Mr. Oscar Littleton, an English teacher in the Excelsior Union High School district at Norwalk, outlines one such workshop centering in the high school activities program.

Perhaps the most common criticism of education courses and institutes is that they solve all the problems except those that the teacher meets every day in his work. Both teachers and administrators want to know specifically what to do about concrete problems.

A step toward correcting this situation was taken in the summer of 1953 at Excelsior High School, Norwalk, California. Administrators and teachers had been asking why a summer workshop could not be held to work on some actual, firsthand problems. Early in the spring enough enthusiasm was evident to make definite planning possible, and just before the end of the school year those interested met and decided to tackle the activities program.

A number of questions needed answering: Was the activities program helping to achieve the objectives of the school? Just who benefited from it? Was participation adequate? How could the program be evaluated? Was it a sound program? Did it need changing? How? What about activities *vs.* the classroom?

The workshop was held as a regular education course in the program of Long Beach State College. Two units of graduate credit were given. The group met on the high school campus for the last two weeks of summer vacation.

The high school chose as consultants from the college teaching staff, Dr. Carl Amundson and Dr. Jack Searles. These able and effective teachers strove to set up a framework in which each participant could contribute his best to the goal of the workshop.

There were no textbooks and essentially no lectures. Study materials came from the experience of the workshop personnel. School administrators and teachers participated with equal status.

The first accomplishment of the workshop was to formulate, in writing, the educational objectives of the school. Many members felt this necessary as a standard to begin with in establishing evaluative criteria. Next, to clarify the place of activities in the whole educational program, the mem-

bers of the workshop set up the following list of objectives for the activities program:

1. To offer a variety of worthwhile activities sufficient to attract and hold student membership
2. To create experiences that provide for successful group participation
   a) Insure individual success in the group
   b) Develop creative leadership
3. To provide experiences that develop social skills, to create situations which promote accepted behaviors, to provide the basic understandings necessary to get along in society
4. To provide opportunities for the development of good school spirit
5. To provide opportunities for students to discover, develop, and express special interests vocationally and/or avocationally
6. To create natural situations for the expression of the physical and emotional needs of the normal adolescent
7. To supplement the school curriculum by providing additional opportunities for the development of physical and mental skills
8. To develop higher personal standards of moral and ethical behavior
9. To create opportunities for personal associations that give students assistance with their individual problems
10. To nurture appreciation of the cultural aspects of life

Three main committees then dealt respectively with orientation to, participation in, and evaluation of the activities program. Each committee formulated a report covering the assigned phase of the subject and submitted it for criticism and reformulation by the entire group.

The committees delved thoroughly into their subjects, using direct experience, school records, reference materials, and suggestions of other committee members and consultants. Each group chose a chairman and a recorder to compile the preliminary and final reports. Final committee reports were submitted before the entire workshop on the last day of meeting, and all reports were assembled to give each member a permanent record.

These reports and a social hour in the form of a breakfast marked the official end of the workshop known as Education 204, but the real results actually began to take place after school started in the fall of 1953. The first of these was the compilation of a 21-page booklet by the administrative staff describing the workshop and detailing the findings.

One important conclusion of the group was that in this high school no *extra*-curricular program actually exists. The activities are rather *co*-curricular and simply supplement the classroom and offer situations where some of the educational objectives can be met more fully and easily than in the more formal and restricted area of the classroom. The workshop

indicated that the activities program in its present state is basically sound and that the problem is to do more effectively what is being done and to try to reach more students, particularly freshmen.

As a result of these conclusions the effects of the workshop are being felt by the student body through modifications and additions now under way in the activities program. With the need for greater participation in mind, particularly for freshmen, several new clubs have been organized and some old activities have been reconstituted to attract the ninth-year student. A periodical activities bulletin is being published to stimulate interest, and a pamphlet for new students has been printed to explain the activities in the various fields of interest.

Since clubs make up only a part of the activities, the auditorium programs are being used to further participation. An auditioning plan has been established to uncover all possible student talent. Every effort is being made to present programs that utilize the maximum of student talent and blend classroom activities with those outside the classroom.

To make the whole program run more smoothly, a teacher has been appointed as co-ordinator with a definite amount of time allotted to help in planning the auditorium programs and in fitting the various activities into the school pattern.

In addition to its specific results the workshop was generally valuable in energizing, highlighting and evaluating the activities program. There were secondary benefits in the field of personnel relationships, particularly in making older teachers better acquainted with each other and in orienting new teachers to the school. As often where people work together, the participants came to know, respect, and like each other—a benefit usually lost at the conclusion of the university course, where everyone goes his separate way. But in this case the feeling of solidarity developed by class work remained to carry over after the opening of the school year.

TEACHING STANDARDS

Teaching standards are higher. You won't be able to see it, perhaps, but you should know, as you visit the schools, that the teachers are better qualified now than ever in the past. In 1931 only 10 percent of the elementary school teachers held college degrees, as against 70 percent last year. On the high school level, 50 percent of the teachers held college degrees in 1931, compared with 96 percent a year ago.

Commenting on this growth, Dr. Samuel M. Brownell, United States Commissioner of Education, believes that a larger proportion of our teachers are better prepared to assume their responsibility in the classroom. This improvement is not only a matter of added college years. It means, too, that for the most part the teachers are better trained, they understand how to teach more effectively, and have a greater breadth and vision in conducting their classes. That is certainly a plus mark.

—*New York Times*

Teacher Recruitment Through a Junior College Course

By TED GORDON

Dr. Ted Gordon teaches courses in education and sociology at East Los Angeles Junior College. As a member of the teacher recruitment committee of Epsilon Field Chapter, Phi Delta Kappa, he became interested in methods of securing good candidates for the teaching profession. This article describes one promising means which he found on his campus.

For some time East Los Angeles Junior College, like a number of colleges throughout California, had been offering a daytime course, Introduction to Education, with orientation to teaching as a prime motive. Mr. R. H. Keamer Walter has given this course with considerable success both for avowed pre-teaching majors and for those contemplating majoring in teaching. It was now suggested that a new source of recruits might be tapped: those people who worked by day and those not otherwise reached by the regular schedule of classes. The purposes of the course would be:

1. To gather together a variety of people interested in the possibilities of teaching as a career—newly graduated high school students, housewives, those contemplating changes in major, pre-teaching majors, etc.
2. To expose this group to a variety of experiences which would result in coming to a decision about whether or not to teach.

Duplicated announcements were placed in public libraries, sent to high schools, and directed to P.T.A. groups; post cards were mailed to registered pre-teaching majors with suggestions to pass on the information to their neighbors, parents, friends. Despite the limited number of these announcements and cards to be circulated, the first class meeting found a registration of twenty-eight individuals, eighteen men and ten women. All but two completed the course. A first-day "Membership Questionnaire" revealed most illuminating responses to such questions as "How I Happened to Be in This Class," "Why I might Be Interested in Teaching as a Career," and "What I Expect to Get Out of This Class." There was indication that a more intensive search could have doubled the number who enrolled.

The class met Tuesday and Thursday evenings from 7:00–10 p.m.

for six weeks during the summer for two units of college credit under the catalog designation of Sociology 30: Introduction to Education.

The immediate aim of class organization was to build up a spirit of camaraderie; of teaching and learning as a gay, stimulating, heartwarming activity. This was gratifyingly successful. A Get-Acquainted Session with "Name Games"; refreshments and conversation during the halfway "break"; formation of committees, all added up to making the group an instructor's delight.

Basic purpose of the class meetings was to answer questions about teaching. To this end, the class members turned in their questions to be pooled with hundreds collected over the years from other courses and other students. These questions were categorized to fit the time prescription into: Teaching as a Career; Qualifications and Training; Life in the Classroom; History, Philosophy, and Types of Education; Elementary Teaching; Secondary and Other Teaching; Financial Aspects; Professional Relationships. Each main topic had some 25–50 sub-questions, pertinent and impertinent, but of serious import to some or many, all duplicated in a sort of syllabus. Panels and committees were organized to delve into the questions; to make use of resources such as collateral reading, guest speakers, audio-visual materials, field trips. The textbook the class used was *Introduction to Teaching in American Schools* by McCloskey, Katterle, and Oviatt (Harcourt, Brace, 1954), as previously recommended by a committee of students and faculty members.

Guests sitting in with the committees included: Dr. Aubrey Berry and Mrs. L. P. Dupre of U.C.L.A. who explained the program of the state university and, especially, its placement processes; Mr. D. C. Barnett of the Los Angeles City Schools Personnel Division who explained the city's personnel and employment policies and practices; Dr. Herman Sheffield and Mr. John Steinbaugh of the University of Southern California who explained the program of the private universities; Dr. Nathan Kravetz who explained, from his experience as teacher and principal, the opportunities in the elementary school.

Quite a hit was made upon the two occasions when the committees included as guests youngsters from Grade 3 through Grade 12. Their refreshing frankness about "Teachers We Have Known—How They Teach and What They Teach" was impressive! Appearing also were former students now teachers who were able to project the class members into the future. Dr. Delmar T. Oviatt, Los Angeles State College, not only talked about opportunities in teaching but also related, as one of its authors, the history of the textbook!

Among the films seen by the class as a group or by individuals for committee report were: *Who Will Teach Your Child, Types of Schools, Our Teacher, Mary Dean, Teaching, Using the Classroom Film, Broader Concept of Method, Tips for Teachers, Importance of Goals, How We Learn, Accent on Learning, Maintaining Classroom Discipline, Problem Children, Problem of Pupil Adjustment, Chalkboard Utilization, Film Tactics, Play*

Materials in the Elementary School, A Day in the Life of a Five-Year-Old, Answering the Child's Why, Learning to Understand Children, Right or Wrong, Play Is Our Business, Fight for Better Schools, New Tools for Learning, Guidance Problems for Home and School, It Happened in Springfield, Counselling—Its Tools and Techniques.

No effort was made to secure a large amount of outside work. With the class almost equally divided between typical college-age students and non-typical academically unoriented adults, and with nearly all employed full-time, it was deemed wise to concentrate upon motivation toward teaching rather than upon much written work or specific requirements. Thus, voluntarily, some did more reading than others; some were able to visit those few schools open during the summer; some shone and some did not on the few essay and objective-type quizzes that were given. At all times class instruction and class practice was directed toward the idea that teaching is a satisfying, rewarding, pleasant occupation rather than a grinding routine of assignments, recitations, papers, grades.

A highlight of the session was the evening when the group, with spouses and friends (by this time these were visiting class to find out what was going on!) met at the headquarters of the California Teachers Association, Southern Section, where Public Relations Director Frank McIntyre led a discussion of Professional Relationships.

At class end the members were asked to make an "Evaluation—Of Yourself, Of Your Classmates, Of Your Course" through the following questions:

1. What personal traits, characteristics, and qualifications do you now possess which would make you a good teacher? Which do you need to develop?
2. Explain what you will need to do in order to obtain your particular type of job and credential.
3. Select any five individuals in the class. For each one (a) give the name; (b) indicate what type, field, or job in education you think best suited for him or her; (c) why; (d) any comments. Your name will not be used in any discussion of answers!
4. Comment upon the textbook pro and con. What would you tell a future student about it? How would you change or improve it? What would you take out? Liked what best? Least?
5. What are your suggestions for improving the organization, presentation, and content of this class?
6. What teaching techniques have you learned from this class which you would or would not employ in your future teaching career?
7. Now that our course is ending, do you still want to be a teacher? How has this class affected your previous ideas? What difference has it made in your plans? What main things will you remember?
8. Will you indicate below the names and addresses, if possible, of

people who should be informed about possibly taking a course like this one.

The results were most heartening. Individuals were able to make good self-analyses of their qualifications for becoming good teachers and to indicate the next steps toward attainment of their goals. Question No. 3 resulted in every person in the class being named by someone; the instructor found it no task at all to read off, anonymously, the complimentary comments and recommendations, and to give supplementary guidance. Extensive comments were made about the textbook and abstracts have been forwarded to the authors. Constructive suggestions were given for improving the organization, presentation, and content of future classes. Question No. 6 on what teaching techniques were learned from the class called forth such impressions as: class participation . . . discussion method . . . visual aids . . . guest speakers . . . field trips. . . treat all students alike . . . make materials palatable . . . get-acquainted techniques . . . no recitation in traditional sense . . . use of library . . . circle of chairs . . . functional type of roll call . . . agenda on blackboard . . . schedule for session . . . variety in examinations . . . class membership list . . . use of pamphlets . . . gatherings in breaks . . .

Possibly of most importance was Question No. 7 on how the class had affected the vocational outlook. A glance over many and lengthy comments shows: Want to be a teacher more than ever . . . Increased my desire to become a teacher . . . Enabled me to sense the professional pride that teachers have . . . Sold me on teaching not only as a career but as an investment . . . Has made me realize that teaching is a much more respected and honorable profession than I had thought . . . Inspired me to work harder . . . Stimulated me to speed up my study program . . . Made me aware that my age is a barrier . . . Made up my mind not to be a teacher . . . I wasn't before but now I am decided . . . Given me more lucid picture of teaching as a whole . . . I feel more enthusiastic.

Significantly, the class members gave the names and addresses of forty-three people they wanted notified about a similar course in the future.

The future? More courses attempted like this might make it look very promising for teacher recruitment!

BOOKLET REPRINT

Education of the Gifted, a publicaiton of the Educational Policies Commission which has been out of print for over a year, has been reprinted in response to continuing demand and is available at this time.

A policy statement first released in 1950, *Education of the Gifted* deals with the training of exceptional children and youth, offers suggestions for recognizing gifted children, and discusses programs and special problems dealing with their education.

This booklet may be ordered from the Educational Policies Commission, 1201 Sixteenth Street, NW, Washington 6, D.C., at 50¢ per copy, with quantity discounts.

A 'New Role' for Principals

By WILLIAM PLUTTE

As Principal of De Anza High School in Richmond, William Plutte knows well the many duties of the secondary administrator. Still he proposes to add one more responsibility. Both administrators and teachers will be interested in Mr. Plutte's argument for this "new role."

The secondary principal is a busy man. He needs to understand school finance even if he is in a large district with a separate business office. He attends seminars, conventions, and conferences concerned with personnel problems. Endless yearly reports are under his cognizance. Even though he may delegate certain responsibilities, he is obliged to understand the mechanisms included so he may have a clear picture of the operation of his school. So he usually thinks he can justify his claim that he just can't "get together with the students."

Yet this administrative casualty really has no practical basis. There is no secondary principal who is too busy to meet the youngsters. True, there are many times when administrative paper work, or conferences, may postpone the opportunity, but that is usually a result of inadequate planning, not unavoidable circumstances.

Sometimes this mistaken belief stems from a notion that knowing students is only possible through teaching students. True, a principal would be made aware of teachers' classroom problems, through this procedure, especially if he were prone to forget his past frustrations and worries when he was a teacher himself. Still the principal would not get an entirely true picture, since students would be aware of his position. He would not be stepping into a classroom as a full-fledged teacher.

Several teenagers were questioned about their opinions regarding teaching principals. "I just didn't feel comfortable in that class. In all my other subjects I received high grades, but in that class I seemed to go to pieces and dropped below average," said one.

Another felt, "The principal seemed to want to have us feel at ease, but it didn't go over. That class dragged longer than any of my others. And, it used to be my favorite subject."

One intelligent youngster believed, "The class, with the principal was certainly the most orderly I had, but I felt like it was the quietness of a vacuum."

The principal, after the heroic effort indicated, "I thought the idea was wonderful. My plans were to give students a feeling that the principal

need not be thought of as an ogre hidden away in a remote office. However, I have to admit that I don't want to try the program again. All semester I could almost feel the wall between the youngsters and myself. And I know it wasn't because of lack of preparation, or antagonism on the part of the students. The same youngsters I had in class would see me during lunch, or after school and be perfectly at home. It was just that classroom. I could hardly wait for the end of the term."

Possibly that principal discovered the answer to a difficult problem without realizing it. What is paramount for many principals is a desire to know the youngsters, not just the routine operation of a school. This goal is almost always frustrated when the administrator moves from his office to the classroom.

Should we then assume that the principal must remain hidden in his sanctum-sanctorum? Actually, the principal should strive for a "new role" in student leadership. He can participate in the student activity program to a degree that will give him an understanding of the school climate, and an insight into the problems of youngsters. By working with small groups, the principal can become a real student leader. He can enter into discussions on a basis that will exemplify assistance rather than direction. Whether it be a school council, a service organization, special club, yearbook staff or school paper editors, the willingness of the principal to participate actively and as an adult *member* of the group will pay dividends.

Principals who have taken part in such activities reflect a general feeling of satisfaction. "It is amazing to sit in with youngsters, in an informal manner, and take part in discussions. Thinking back to my high school days, I feel that the grasp on social problems, displayed by our youngsters, indicates a tremendous amount of growth.

Naturally the question arises, "How can I, with all my obligations, find definite periods of time to meet with specific groups?" Actually, if there is a real desire on the part of the principal, he can, as easily, schedule definite meeting times with youngsters as with faculty.

However, this procedure is actually unnecessary, and possibly not desirable. Sponsorship of a special group could easily lead to complications. But, the principal who finds time just to drop in on meetings will be pleasantly surprised. Students will welcome his interest and be happy to have him participate in the discussions.

Often serious conflicts can be circumvented when the principal is present. As one principal described a meeting, "I happened to sit in on a council meeting shortly after it had started. As I entered, a discussion was being carried on about holding a street dance following our 'big game.' While I listened, I felt the council was rising to a fever pitch. The realization dawned that the recommendation which undoubtedly would be voiced might set up a wave of student interest that could become a serious problem, especially since I knew that the city council had accepted an ordinance banning street dances several years back. To be brief, I explained to the group that an ordinance did exist, time was too short to attempt a possible

change, and possibly the best procedure would be to alter plans for this year. To my surprise, the council went along with my suggestion; the dance was shifted to the gym and a follow-up suggestion set up a committee to investigate special city ordinances that directly affected school activities. I was quite relieved, for I had had visions of 'protest marches,' 'student strikes' and sundry other problems."

Very often the presence of the principal at student meetings will help immeasurably with similar problems. Possibly these student incidents may appear inconsequential, but the total accumulation of many of these minor problems could affect school morale to a great degree. The principal who is fortunate to forestall such situations has well spent his time.

In summary, the principal who finds the time to participate in the student activity program is well repaid through a better operating school. What is most important, he is not a secluded symbol of administrative pomposity, but a vital, working part of a good school.

40TH ANNUAL NASSP CONVENTION IN CHICAGO

The 40th National Convention of National Association of Secondary School Principals will be held in Chicago, February 25–29, 1956.

Plans presently under way indicate that this will be one of the best conventions in the Association's history.

If you plan to attend and have not yet made your hotel reservations, make them now!

Chicago Convention Bureau
134 North LaSalle Street
Chicago 2, Illinois

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But Who Counsels the Counselor?

By GEORGE SHAFTEL

George Shaftel is a professional writer with a special interest in educational problems. With his wife, Dr. Fannie Shaftel of Stanford, he has written widely both about and for elementary and secondary students. In this article, Mr. Shaftel reveals a strong sympathy for the secondary counselor.

At the rear of the classroom the tall ninth-grader had looked up from his test paper and was staring across the aisle at the paper of the boy next to him. The instructor stalked quickly across the room, snatched up the tall boy's paper and crumpled it in his fist as he said, "You're copying!"

"I was not copying," the boy blurted.

"I saw you."

Turning, the teacher walked to his desk and threw the exam paper into the wastebasket.

A fairly commonplace incident; it can easily happen. When you have large classes, and are trying to keep standards up, some young people find the pressure too great and take short cuts. But maybe as a teacher you can reassure yourself that it's not too serious. This student has received a needed reprimand; he'll think twice about copying again. Moreover, other students in the room have received a salutary object lesson: crib, and you'll be found out; it just doesn't work. Also, you'll be humiliated in front of all the other students. Oh, it's a little hard on the cheater, perhaps; but cheating is in a small way a crime, and the young person who cheats is fortunate if he receives a lesson that stops such tendencies in him early. After all, life is tough, and a realistic look at the consequences of misbehavior before they become too serious is a wholesome thing . . .

But let's look closer at the elements of this incident.

You're the instructor. You've given the class a surprise quiz. The hour is almost over. The brighter students have just about finished writing and are beginning to fidget and look around; the slower are bent even lower over their papers, their frowns more intense, working with an edge of desperation. You see this tall boy staring at his neighbor's paper. You feel a sharp flare of anger. If there's anything you hate, it's the person who hasn't the guts and the integrity to stand on his own feet, to abide by his own achievement. You stride down the aisle and snatch up the culprit's paper and toss it into the wastebasket; you let him feel the lash of your contempt. Maybe he can get away with such conduct in a less alert teacher's room, but not in yours!

Back at your desk, you have an uneasy moment.

Was this, in the long run, the best method of handling such an incident?

The boy is sitting there, eyes downcast, his face flushed, a bitter droop to his lips. *Well, he brought it on himself!* A neighbor whispers something to him; the boy looks up, grins uneasily, managing a bit of defiant oh-the-heck-with-it. He hasn't been a comfortable element of the class; you've always felt that you haven't been quite able to reach him.

But *was* this the best way to handle the incident?

What else could you have done? Ask the student to come to see you after class, then tell him that you saw him cheating? No doubt he'd have denied it. Then you could simply have compared his paper with his neighbor's, and the proof would have been positive. But the cheater might have argued that the other boy copied from him! Or that the similarity—if the papers showed similar mistakes—was mere coincidence; or, if both were correct, that he and his neighbor had each solved the problems. No. The impact of being caught in the act and publicly exposed would do more to kill the student's propensity to cheat than any other treatment would do; it really burned into him the consequences of misbehavior . . .

At home, that night, the student blurted out the incident to his father; and, next day, the father came to high school to see the boy's counselor.

"If the boy had been cheating," the father says, "he would have felt guilty and wouldn't have mentioned the matter to me. He claims that he was almost finished, that he had about 95 per cent of the problems answered correctly; that he was just sitting there, staring at nothing, thinking about a problem. He was simply stunned when the teacher swooped down on him and grabbed up his paper. I believe my son. He's always been honest with me. He says that anyway, if he wanted to cheat, why in the world would he copy from a neighbor who is always getting *F*, while he himself has been steadily getting good grades."

You're the counselor. You sit there, turning a pencil in your fingers, considering. Parents always defend their children.

The father says: "If this teacher really believed the boy was cheating, why didn't he compare the two papers? He didn't even look at the answers! Just crumpled my son's paper up and threw it away! That's the kind of behavior you'd expect of a hardboiled drill sergeant in the Marines. My youngster has had a hard time getting friendly with his teachers. This experience won't help."

You see that. You see a number of things.

After this incident, how well is this student going to relate with this particular teacher?

And what is the boy's attitude going to be toward the subject matter? Actually, he was doing well in the subject; it was one in which he might later have majored; but now, after this setback, he may shrink from it, in distaste and uneasiness.

Moreover, this incident may make it harder for him to establish rapport with other teachers. In fact, he may soon develop a set against further education.

"I told him," the father is saying, "that he ought to go see his counselor,

that it's your job to straighten out matters like this. He refused. He says that the kids say that you go to a counselor and nothing happens. They say that counselors are just crying towels. You go weep into them and that's the end of it."

You feel yourself flush. That's unfair. The father should know that. Of course, in most cases, you do listen to a student, and that's all; but that's all that's necessary—the mere act of talking out some trouble serves as a catharsis and provides all the help that the student actually needs to unburden himself of an emotional problem.

"Can you do something about this?" the father asks.

You stir impatiently. What *can* you do?

"If the boy was cheating—"

"Does he have a record of cheating?"

"No . . ."

"And the instructor, after all, didn't compare the two papers. He can't be sure. Look, my boy needs help."

You sigh. You're a teacher-counselor; you're just learning your job, after all. . . . The books say, of course, that the counselor is on the side of the student. But you're a teacher; you have to work with your colleagues. You can't go to this instructor and say, "Sorry, Ed, but you really goofed this one up. The boy was just daydreaming, and you lost your temper and bawled him out for something he didn't do."

Suppose Ed retorts, *"I say the kid was cheating!"* And if you come back with: *"But did you look at the papers?" Have you any proof?"* he'll probably glare at you and just walk out. Then what do you do?

"What can you do about it?" the father asks.

"Well . . . suppose I move the boy into another math class?" But when the father nods agreement, you have to point out, "We may just be buying more trouble. If your boy's sensitive, how's he going to feel about being changed in the middle of the semester? It'll seem like he's getting a lot of unsavory attention, and he'll feel guilty and wish he'd never opened his mouth about the matter."

The father nods, his face troubled.

"He didn't want me to come here. He didn't want me to do anything about this."

"I'm glad you did," you, the counselor, say automatically. Then you wonder. Are you? You should be, but . . .

The father says, "That instructor owes my boy an apology."

"Unless your boy actually was cheating."

"But I told you—"

He gives up. Both of you have the feeling of going around in circles. The father leaves, and you sit there, doodling bemusedly on a scratch pad. In your euphoric moments, you reflect wryly, you've thought you had the answers. Now you feel uncertain and incompetent. Though you're learning, you'll never, you realize, have all the answers; for the more you learn, the less you know.

What's Happening in California Secondary Schools

By WILLIAM N. McGOWAN*

Of major concern to California secondary schools in recent years has been the continued interest of the University of California in the possibility of using standardized tests as a basis for approving high schools. Adding to this concern is the recent recommendation of the liaison committee between the University and the State Department of Education, established at the direction of the State legislature to make a "Re-Study of the Needs of California in Higher Education," that "the high schools, the junior colleges, the state colleges, the University of California, and, if they so desire, independent institutions, co-operate in establishing a state-wide high school testing program for the purpose of supplying essential data for counseling students concerning college attendance, in predicting college success, and in administering admission policies."

University of California officials have consistently maintained that California secondary administrators should adopt some procedure whereby the University approval of high schools might be supplemented by a more comprehensive appraisal of the high school program than that afforded by the University. The concern of many secondary school administrators is that the University will institute a testing program as basis for approving high schools before the secondary schools can develop a procedure for a more effective basis for accreditation.

Over the past seven years a committee of CASSA has struggled with the problem of developing a program for evaluating the total secondary school program. Various reports regarding this work have been made. (See the March 1954, *California Journal of Secondary Education*, an article titled "Self-Appraisal Procedures," and the October 1954, *Journal*, an article titled "Next Steps in Evaluating California Secondary Schools.") After four years of work on development of a procedure for evaluating the total secondary school program, making nine revisions of the forms designed for use in the procedures, and conducting experimental use of the procedures in over forty schools, the CASSA *Committee for the Evaluation of the Total Secondary School Program* has had its procedures printed, and they are now ready for distribution. Basic purposes of the developed procedures are to assist a school in evaluating its own program in the light of its own Board-adopted policies and objectives, to provide the school with a body of data that can be used in interpreting the school program to the Board and the community, and to supply data that can be used as a basis for an in-service program of curriculum development and general improvement of the total school program. Inquiry regarding these

* Executive Secretary, California Association of Secondary School Administrators.

procedures may be obtained from the CASSA office, 2220 Bancroft Way, Berkeley 4, California.

It is hoped that some progress can be made with all interested parties toward acceptance of the CASSA Procedures as a basis for accreditation of California high schools. Such a move would not, of course, supplant University approval, but would do what the University has requested, augment such approval, supplement it by extending the basis of approval from that of concern only with the college prep function of the school, to consideration of the total school program. Unless this is done by the secondary school people themselves, it appears likely that some other agency or group will do it *for* the secondary schools, and if this occurs, all indications are that such a move would include the imposition of some sort of state-wide and uniform testing program. There are many who feel that this would be a most unfortunate eventuality. It will be up to secondary school administrators to determine whether or not to accept CASSA's lead on the use of its "Procedures" as a basis for accreditation, or wait until the University or the legislature institutes a state-wide testing program.

What's Happening in Junior High Schools

Something new in math. At Pacoima Junior High School in Los Angeles, math tests were given at the beginning of the semester and pupils scheduled for math any one period were re-grouped according to achievement on these math tests. Classes include a mixture of grades—conceivably, B7's through A9's may be in the same class. A teacher workshop is preparing materials for the various group levels. It is hoped that the rate of improvement in math skills can be greatly increased. One definite result so far is that upper grade pupils are greatly sobered by a realization of their actual achievement in math as indicated by their placement in classes with lower grade pupils.

Minimum essentials departmental tests are being reported as useful adjuncts to the educational program in a number of Los Angeles junior high schools. As far as possible, the "departments" attempt to assure that all students reach minimum requirements before moving on.

Youth takes a stand. That young people are vitally interested in community problems was demonstrated, recently, at Cabrillo Junior High School in Ventura. An election had been called for November 29, at which time the voters within the boundaries of the Ventura River Municipal Water District were to decide whether to approve a contract for the construction of the Casitas Dam and related recreational and water supply projects.

The students in the ninth grade Social Studies classes decided to investigate the question of obtaining an adequate water supply for Ventura County. They immediately set to work, as a group, gathering information, compiling the data, and discussing the issues involved. Through the co-operation of their principal, Dr. Charles W. Webster, pamphlets on the Ventura River Project were made available to every ninth grade student.

Interest in the project mounted. Posters and bulletin board displays appeared. Mr. George M. Purvis, President of the Ventura River Municipal Water District, was invited to meet with ninth grade Social Studies representatives to discuss the project and answer questions. A tape recording of the students' interview with Mr. Purvis made it possible to take back to each classroom a record of what had been said.

The active participation of all ninth graders in this undertaking made possible a much better understanding of the meaning underlying a bond issue and the problem involved in meeting its repayment. From their study the students were able, too, to grasp some of the technical difficulties encountered in the building of a dam. This project gave them definite insight into one major problem facing their community.

On election day the ninth graders carefully marked their sample ballots. A tabulation of the votes cast showed that the Casitas Dam project carried almost unanimously in the school. In the Ventura River Municipal Water District precincts the qualified voters also voted their approval of the project. Much of the credit for arousing public interest in the water problem, and for stimulating intelligent discussion of the issues should go, undoubtedly, to the Cabrillo Junior High School students.

What's Happening in California Four-Year and Senior High Schools

Future teachers. Recent reports indicate that even with the growing increase in college enrollment the percentage and even the number of teaching degree candidates is not increasing. The present need and the obvious future increased need for teachers indicates the advisability of present action.

North High School of Bakersfield is this year continuing a student teaching program started last year. It is a club type activity open to junior or senior students with a successful college preparatory course of study who indicate an interest in teaching as a profession. The course allows full credit toward graduation.

Two teacher directors take the responsibility of preparing the course content, recruiting classroom teachers to accept student teacher supervision assignments, and meeting with the student group once each two weeks. Prior to the opening of school the directors meet with the supervising staff and plan the semester's work. The student's schedule is arranged so that assignments can be made to a supervising teacher in a course already completed by the student. The students meet with the directors each two weeks for discussion and assignment of outside work designed to enrich the program. The students are graded jointly by the directors and the supervising teachers.

Listed below are some of the functions of students in assigned classes.

1. Fill out absence slips and help handle tardiness and readmit slips
2. Help individual students at their seats

3. Help with make-up and missed assignments
4. Issue texts and class materials
5. Bring newly enrolled students up to date
6. Work on bulletin board
7. Help grade and record papers
8. Run projector or other AV equipment
9. Collect outside materials for bulletin board
10. Read morning bulletins or announcements
11. Help supervise student committee work
12. Look up and present class report on special days such as Admission Day, Constitution Day, Columbus Day, etc.
13. Enrichment of class studies through individual research

The program has not been in operation long enough to base any accurate conclusions, but participants—both students and teachers—are finding the experience mutually enjoyable.

The CASSA Committee on Curriculum Development has instituted a study program that will eventuate in the production of much valuable information for the use of California secondary schools. Active groups have been established to study:

1. Policies on relationship on curriculum co-ordinators and principals
2. The testing program
3. Study guide on individual differences
4. Curriculum policies
5. The gifted child

Points of inquiry regarding the progress of study in these areas may be addressed to Dr. Grant Jensen, Principal, Shafter High School, Shafter.

What's Happening in California Junior Colleges

American River Junior College, a new two-year public junior college, opened its doors for the first time in September 1955. Some 580 full-time day students registered as freshmen and sophomores in this new institution.

The American River Junior College district includes San Juan and Grant High School districts. This area may be identified as that portion of Sacramento County north and east of the American River. At present 200,000 persons reside here.

American River Junior College is currently operating in leased facilities in what was formerly the Grant Technical College campus. A complete new campus is being readied for occupancy in September of 1958, at which time an initial enrollment of 2,200 is expected.

A new six-month's curriculum for surgical technicians was opened at Sacramento Junior College on November 28. This is a postgraduate curriculum for licensed vocational nurses. The curriculum was established at the request of local physicians and with the approval of the advisory com-

mittee and the Board of Education. The curriculum is limited to ten students.

For the remainder of this year and the early part of next year, Sacramento Junior College will be busy planning for the expenditure of approximately $200,000 for new facilities for an expanding vocational program. These new facilities are being planned in conjunction with those which are being established by the new neighbor, the American River Junior College District. By joint planning, a wider program of vocational education for the young people of this area will be possible.

Growing pains at San Jose Junior College were eased somewhat in November when the college occupied a new administration building and a new science building, reports H. R. Buchser, director of the college. Two more buildings, library and gymnasium, are being readied for occupancy in January.

Administration, library and science buildings represent an expenditure of $483,401; the gym an expenditure of $360,308.

Enrollment for the first semester of the current school year, the director reports, has exceeded 3,600 students, 1,800 full-time day students and an equal number of part-time evening students of the Technical and Industrial Division of the College.

Formerly administered in conjunction with San Jose State College on the State College campus, San Jose Junior College was separated from the State institution and moved to its own campus starting with the 1953–54 school year.

The school year 1955–56 sees developments at Shasta College which indicate the institution is carrying out its responsibility as a junior college. Three brand new trade courses have been initiated in the fields of cosmetology, carpentry, and body and fender repair. In addition, there has been an expansion in the addition of a second year program in heavy-duty equipment maintenance and repair. Second year courses have been added in the medical and dental secretary programs. Bids are being called for a Business Education wing in January 1956.

REPORT CARDS AND HOMEWORK

Report cards and homework—two education items of interest to parents everywhere—are the subjects of special articles in October's "School Executive." Jack Lipsy, a New Jersey school superintendent, writes about how an advisory committee drew up a homework plan based upon the school grade. Two California educators, Theo J. Norby and Albert Grant, report on a new "community-centered" report card.

Current Events and Materials in Mathematics

By DALE CARPENTER

In place of the kind of summary of events and materials which usually is presented in these pages, Dale Carpenter has persuaded three people prominent in mathematics to discuss some needed developments in mathematics education. One of these articles is presented this month. The other two will appear in subsequent issues. Mr. Carpenter is Mathematics Supervisor, Secondary Division, Los Angeles City Schools.

Articulation of a Secondary School Mathematics Program with College

MYRON F. ROSSKOPF*

Newspapers and periodicals have printed many accounts during recent months of the small number of students taking science or mathematics courses in high school or college. The impact of this situation upon our economy and our country has been described so often that there is no need to repeat the description here. There already exists an aroused public concern with the problem. Many professional organizations are devoting large sums of money to the purpose of investigating ways and means of turning the tide, of increasing the number of students studying mathematics and science. The National Science Foundation has recently finished a series of meetings at Rutgers University that were devoted to a consideration of the problem and ways to solve it. In addition, the National Manpower Council released its report of meetings held in April 1955; the gist of this report is that changes must be made in secondary school programs to lead toward greater improvement and more study of mathematics and science.

What are some of the causes of such widespread worry over the problem? The causes can be summarized in two words—short supply. So long as there were no large calls for mathematicians or physicists, no one worried. A number was graduated that was large enough to satisfy the needs of high schools and colleges for teachers; the occasional request from a

* Teachers College, Columbia University.

government agency or from industry for a person with special qualifications in mathematics or science presented no problem. Occasionally chemists or engineers seemed in short supply, but no problem of large dimensions appeared.

Most reports date the beginning of the present problem at World War II. The tremendous expansion of factory facilities for production during the period of the war, the scientific progress made through weapons research, and the widespread use of quality control methods called for larger and larger groups of technically trained personnel. After the war these production facilities were turned to defense and consumer products. The federal government expanded its support of scientific research. Although the larger share of the funds was allocated for applied research, still some funds were used to support pure research in several scientific fields, including mathematics. Many industries that had never had such a division before established a department that was called "research and development."

Nowadays there are three groups competing for college graduates who have engineering or science or mathematics degrees; these are government, industry, and schools or colleges. There seems to be no way to overcome this problem of numbers. Two suggestions that have been made are (1) increase the number of students enrolled in mathematics-science programs, and (2) change the undergraduate program to include aspects of contemporary results in mathematics-science fields. Both suggestions are being worked on. It is (2), however, with which this paper is concerned.

There is much evidence that could be marshalled to support the assertion that college mathematics departments, mathematics organizations, and individual mathematicians have done much to change undergraduate mathematics programs. A long list of textbooks could be presented, each containing an approach to freshmen courses or calculus differing from the traditional. Some of these textbooks are designed for use by engineering freshmen; others for those freshmen not going into science or mathematics. A committee of the Mathematical Association of America has been working on a course for the first two undergraduate years called *universal mathematics*[1] and another group made up of representatives from this organization and the American Mathematical Society have been trying out mathematics courses for social scientists.[2] Already there are beginning to appear printed materials that are designed to carry out the purposes of these two committees.[3] That many departments of mathematics are thinking about

[1] Report of the Committee on the Undergraduate Mathematical Program, *The American Mathematical Monthly*, vol. 62 (August–September 1955), pp. 511–20.

[2] R. R. Bush, W. G. Madow, Howard Raiffa, R. M. Thrall, "Mathematics for Social Scientists," *The American Mathematical Monthly*, vol. 61 (October 1954), pp. 550–61.

[3] The 1954 Summer Writing Group of the Department of Mathematics, University of Kansas, *Universal Mathematics. Part I. Functions and Limits.* Lawrence, Kansas: Student Union Book Store, University of Kansas, 1954.

Kenneth O. May, *Fundamental Mathematics. Vol. I.* Preliminary edition. Cambridge, Mass.: Addison-Wesley Publishing Co., 1955.

the problem of updating undergraduate courses is clear from a report of Cameron[4] who visited a large number of campuses in 1952.

A reader might well ask what all the foregoing information has to do with the secondary school program in mathematics and science. Are we to return to a state of affairs in which colleges and universities dictate high school programs? Not at all; there are more reasonable men and women today in both camps, that of the colleges and that of the secondary schools. A program cannot be worked out as an isolated set of experiences. A program of instruction must consider what precedes it and what follows it. For this reason, it is necessary for a group of secondary school people in mathematics to be familiar with what is going on in arithmetic in the elementary school and what changes are taking place in collegiate undergraduate mathematics.

Anyone who has looked at recently published series of textbooks in arithmetic for elementary schools knows that many changes have taken place. The emphasis upon securing understanding of concepts by youngsters and making meaningful the operations of arithmetic have led to much change in junior high school programs in mathematics. The ferment in collegiate mathematics will have, analogously, an impact upon senior high school programs.

There is a growing number of persons in the area of mathematics teacher training who are familiar with what is going on in mathematics today. These persons are the ones who write the greater percentage of secondary school textbooks. One can infer from these assertions that gradually some of the ideas they talk about in their classes will begin to appear in the textbooks they write. Their students will appear in a growing number of classrooms; these students will have the necessary background in mathematics to put into practice what they have learned.

A period of transition from the older, traditional high school mathematics program to a newer, different sort of organization and content of the mathematics courses offered in the four years of a high school program is now visualized. Materials will be provided that will develop concepts considered essential in mathematics—perhaps, the same concepts that have always been considered essential—but the routes taken to develop these concepts will be along paths quite strange to many. The paths will lie in areas of contemporary mathematical ideas and applications.

Of course, compromises between the ideal and the actual school situation will have to be made. We are committed to a philosophy of education for all American youth. We believe in providing opportunities for each individual to develop his potentialities to the fullest. There is some question at the present time if schools *have* considered the needs of *all* youth. It may be that the new program will first be offered to those students whose records indicate they can handle the somewhat abstract approach that

[4] E. A. Cameron, "Some Observations on Undergraduate Mathematics in American Colleges and Universities," *The American Mathematical Monthly*, vol. 60 (February 1953), pp. 151–55.

seems a part of modern mathematics. Only a part, say 40 to 60 per cent, of those electing mathematics will be allowed to go into the new courses. Such practices, however, will be temporary until teachers become used to the new materials and learn how to use them effectively in classrooms.

As the program evolves, it will be found to incorporate some of the more abstract concepts of mathematics and fewer of the techniques, less manipulatory mathematics. The emphasis will be on understanding relations, on organization of ideas, and on thinking. Some technique is still necessary, naturally, but technique will be developed by methods different from the here-is-a-model-solution-now-go-and-solve-these-exercises variety. A student who has been repelled by the long lists of exercises that have been a part of most mathematics courses, will find the new program a delight, for he will be able to exercise, to sharpen his liking for correct argument.

The program will be one of enrichment rather than acceleration. Some of the present materials will have to appear, but these will be reorganized or put in a different context. As an example of what might be done, consider the way in which a concept of our number system might be developed. Almost every elementary school child today realizes that our number system is based on counting by 10's. He learns, for example, that $(9+2)$ is the same number as $(2+9)$ and (9×2) is the same number as (2×9). Such a child knows that each place or position of a digit in a number like 4792 has a certain value. The 4 means 4 thousands, the 7 means 7 hundreds, the 9 means 9 tens, and the 2 means 2 ones or units. He learns how to exchange 1 ten for 10 ones or 1 hundred for 10 tens, and so on. This is sufficient for arithmetical computation; the foundation for a correct concept of our number system has been laid.

By the time a student with the foregoing sort of instruction reaches a junior high school, he is ready to have names attached to these familiar laws of arithmetic. He learns that examples of the *commutative law* for addition and multiplication are:

$$9+2=2+9; \quad 2\times9=9\times2$$

That the everyday use of grouping numbers in addition and multiplication is called the *associative law*:

$$2+(8+5)=(2+8)+5; \quad 2\times(8\times5)=(2\times8)\times5.$$

The *distributive law* is the name given to an operation with which he has been long familiar; that is, he can multiply first and then add or add first and then multiply:

$$2(8+5)=(2\times8)+(2\times5).$$

Toward the end of the eighth grade, as a class becomes more and more used to abstract symbolism, a teacher may want to write these laws in general terms:

	Addition	*Multiplication*
Commutative Law:	$a + b = b + a$	$ab = ba$
Associative Law:	$a + (b + c) = (a + b) + c$	$a(bc) = (ab)c$
Distributive Law:	$a(b + c) = ab + ac$	

Let us skip to the problem of introducing negative whole numbers to a class of such students. One can motivate the need for an extension of our number system in a variety of ways. These are familiar to all readers, and there is a good deal of agreement on the value of such motivation. One place where there is wide disagreement is over the question of how to teach the rules for combining signed numbers. One possibility that has been suggested[5] and that we urge teachers to try is the following.

The first step is to talk about possible agreements that can be made, to try to orient the thinking of the class toward the problem. By "talk" is meant just that; the use of any symbolization should be avoided at this stage. Maybe, a question and answer technique would be good in order to get some agreement on what a negative number is. The question, "What number added to 5 would give zero?" ought to receive the answer, "There isn't any such number." From there a teacher can go on to say that that is correct, but he is going to invent a new number, called *negative 5*, such that *negative 5* added to 5 is 0. Questions using other numbers can be asked until the idea and the language is a part of the thinking of every member of the class.

Secondly, the class is ready to combine two signed numbers by addition. The development follows the same plan as before of questions by the teacher and answers by the students. There comes a time when the students will want to use the commutative and associate laws. How do they know that these laws hold for the new numbers? This is an important point. It is here where a teacher needs to be convincing; a teacher must "get across" the concept involved in what is sometimes called the *Principle of Permanance*, the strong desire in mathematics that certain basic laws will hold whenever an extension of the area of operation—into the area of negative numbers in this case—is made. Once the students grasp this idea and accept it, they are ready for all the types of problem that arise in addition. From here it is a natural step to take up multiplication. Now, the distributive law comes into play, and through its *acceptance as a law* in our new system of signed numbers, the usual rules can be derived.

As a third step, rules for subtraction and division are developed. Subtraction is developed in terms of addition, and division is taught in terms of multiplication.

We leave the example at this point. Enough has been given so that a teacher can see what the plan is and—if he so chooses—can fill in the classroom details for himself. Of course, at some appropriate point in the

[5] H. Van Engen, "Logical Approaches to $(-a)(-b) = ab$ and $x^0 = 1$," *The Mathematics Teacher*, vol. 40 (April 1947), pp. 182–85.

learning situation the usual symbol for a negative number is introduced—perhaps, after addition is pretty well learned. It is hardly necessary to point out that here is an important concept of mathematics, the permanence of principles as one progresses deeper and deeper into mathematics. One of the great gains that is seen for such a teaching of mathematics is the equipping of students to handle *ideas*, along with techniques.

My experience has taught me it is the techniques of mathematics that are sometimes extremely distasteful for certain types of students. Give these students an opportunity to see the thinking, the logic, involved in doing mathematics, and their atttiudes toward the subject change. The gain is a larger number of people who are able to work intelligently with mathematics, a field which seems to be creeping into almost every area. Those students who are interested in mathematics as such or in engineering or in any of the sciences will come to their more advanced work with a conviction that mathematics is a *way of approaching problems* rather than a way of grinding out answers; these students will be better able to devise ways of solving a new, strange problem, one that is not a stereotype of the distance-rate-time, mixture, digit, or work sort. These are the gains that I see for the efforts of secondary school mathematics teachers to articulate their teaching and their program with that of the college.

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SYMPOSIUM

Teaching Critical Thinking and Problem Solving in Secondary Schools

CO-ORDINATOR—MARY LOUISE JONES

The controversies about the purposes of secondary education grow more heated every year. But at least one goal seems to remain above the discord. Every critic espouses the necessity of teaching the ability to think critically. Miss Mary Louise Jones, Secondary Curriculum Co-ordinator, Los Angeles City Schools, has brought together a carefully balanced discussion of this universally accepted task. Two articles discuss administrative policy designed to encourage teaching to this end. One article defines what the process involves. Three articles pin down the details of classroom practice.

Administrative Policies for Teaching Problem Solving

By AVERILL M. CHAPMAN*

Will the community support the teaching of problem solving, especially in the area of current public problems which are so important for citizenship? Ultimately the public will decide what the schools are to teach. Administrative policy in any enterprise is a means of achieving the purposes of that enterprise. Therefore if representative people of the community agree that effective thinking is a major purpose of the school, then administrative policy must reflect this purpose. Administrators must (1) secure this agreement, (2) take the lead in getting boards of education and school personnel to define policies, and (3) work out procedures for putting them into effect. Not only purposes and learning experiences must be planned, but adequate learning materials must be provided. Critical thinking does not take place in a vacuum or apart from the content for study.

It is true that every community has pressure groups which seek to

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indoctrinate their points of view and are not interested in having all sides of issues studied. Fundamental difficulties arise out of misconceptions of the role of the school, both on the part of school people and other citizens in the community. To "educate," by definition, is to develop powers by instruction. Therefore, the *freedom to learn*, rather than social action, should be the business of the school. It has been demonstrated even during the recent criticisms of the school program that the community and its elected representatives on the board of education will adopt and support a sound policy relative to the teaching of effective thinking, propaganda analysis, and the study of controversial issues. It has been demonstrated that a successful appeal can be made to fairness and to the traditional and deep-seated belief in the American way of settling differences through study, free discussion, and conference. When the role of the public school is clearly defined—when it is agreed that schools should foster the *objective* study of vital present-day problems in the classroom—when a sound policy has been adopted and publicized—when these things are done, it becomes increasingly difficult for pressure groups to oppose the study of various points of view on public problems.

How can administrators make such a policy work? A systematic plan for the continuous study, discussion and interpretation of the policy—both among laymen and among school personnel—must be followed. We must constantly bring ourselves back to the basic purpose of schools. Administration must encourage and support free objective discussion. At the same time administration must reassure the community that the schools are dealing *fairly* with controversial issues. It is difficult to establish public confidence in objectivity if school people as a group ally themselves with pressure groups. Administration owes teachers the obligation to protect them in the exercise of their legitimate functions. At the same time administration must protect the public against propaganda by teachers, and protect pupils against tackling problems not in keeping with their maturity and interests. Furthermore, administrators must provide learning materials for a wide range of maturity and interest on any grade level—up-to-date materials which furnish content for a complete and objective study. A sound policy requires that all of this study and discussion must take place within a framework of positive instruction in American ideals and institutions.

Problem Solving and Critical Thinking in the Tamalpais Union High School District

By CHESTER G. CARLISLE*

What we Believe

We believe that our schools should operate to promote problem solving in the classroom, in the school, and in the community. This kind of education is essential to learning the ways of democracy not only "for adult life," but here and now in teenage times. It is our hope that our boys and girls will increase their curiosity, their alertness, their inclination to experiment, their willingness to pursue problems through all the disciplining stages of scientific thinking, and that they will act upon decisions emerging from the conclusions drawn from the data which they have found. This, we know, is a large order.

What do We do Administratively?

Inherent in problem solving is student and teacher planning and working on problems of *real* interest. The very reality of interest engenders more enthusiasm, more varied action, more uncharted paths of learning. Our administrators attempt to show by their words, acts, and leadership that they encourage this kind of problem solving. They encourage citizens to be included in class work. They recognize that the learner must learn for himself and that no one, not even a teacher, can do it for him. They accept the fact that a teacher is often a gatherer of resources and an arranger of an environment in which learning can take place. He is not always behind his desk in a silent classroom.

One of the prerogatives which teachers interested in critical thinking prize most highly is the freedom to use their own methods of teaching. Freedom to teach implies a desire to improve and, therefore, an obligation for the administration to supply inservice aid such as workshops, recognition of committee work with consultant service, guided field studies, and many other professional helps. Critical thinking can thrive only in an atmosphere of responsible permissiveness. Such an atmosphere exists only in the degree that our administrators directly encourage it.

For this kind of active learning, it is necessary to provide more than the minimum classroom with desks in rows. Laboratories and workshops must be supplied with equipment. Well-selected resource materials, extensive instructional aids, and library services are important. Hence, budgetwise, our administrators and Board of Trustee members do some problem solving on their own.

Our administrators accept the fact that, as human beings in the process

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of growing and learning, our boys and girls have a right to make mistakes and to rectify them. Consequently, many of our adult ministrations are not stultifyingly protective and preventive, but rather do they urge exploration. To administer this philosophy means that our adults need fortitude and confidence in their colleagues and students. We trust that we have enough.

One recent boost to faculty morale and especially to those who carry the torch for critical thinking is a declaration by our Board of Trustees regarding teaching about controversial content. It says:

"Our schools should furnish opportunities for students to discuss significant controversial issues appropriate to their maturity under the direction of competent teachers. The school through constant teaching of the established truths of our American heritage furnishes a foundation and a framework. The student as a citizen should be able to evaluate controversial issues from this training.

"Issues which are controversial arise from differences in interest and in opinions held by the major political parties, management and labor, urban and rural populations and other groups who differ on the proposed solutions to major problems. The schools should furnish opportunity for the students:

1. To analyze current problems
2. To gather and organize pertinent facts
3. To discriminate between fact and opinion; to detect propaganda
4. To draw intelligent conclusions
5. To respect the opinions of others
6. To respect the principle of majority rule
7. To respect the rights of minority groups"

Needless to say, this stand is of great support to our administrators.

Where it Occurs

Problem solving occurs anywhere that students and teachers want to sharpen their powers of critical thinking—in every phase of the total curricular offerings. The following examples illustrate where problem solving has recently been employed:

In an Art class the students and teachers explored possibilities, gathered data, made decisions and worked together to create a nativity scene of life-size figures for Christmas in the town square.

In four social studies classes on Problems of American Democracy, students and their teachers met with local and county officials to explore all facets of information relating to a proposed anti-loitering ordinance.

In a sophomore English class students, through a unit on prejudice, explored prejudice as it is expressed in our culture.

One language teacher, on sensing tensions in the school, encouraged students in "finding facts, filtering facts, facing facts, and following facts."

With several teachers and classes working together, the pranks of noontime drivers finally created a "Parking Bill." The teacher of social studies who guided the learning is skilled in the processes advocated in the Citizenship Education Project.

The English classes have focused attention on study skills thereby helping the students define, diagnose, and select some custom-tailored ones for themselves.

A dramatics class, with the teacher and students working together, employed an extensive laboratory research process in planning, developing, and evaluating their work as individuals and as a group in modern play production.

A follow-up of alumni who were topflight students in science elicited many expressions of the same response, "more and more problem solving." As one former student summarized succinctly, "If you can't work through problems, you don't really understand the subject."

The teachers of the mentally retarded boys and girls developed with each student some inside-of-school work experience. This started with the first clues of interest and then proceeded through the "bite size" steps of problem solving to the final evaluation. This was followed by the students' decision to attack the next problem of preparing and succeeding in out-of-school work experience.

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Problem Solving: Why it Isn't and What it is

By RICHARD E. GROSS*

All of us have been reminded frequently about the need for reflective thinking experiences in the schoolroom and of the importance of problem solving in the education of young democratic citizens. Our work in the fields of mathematics and sciences has exposed us particularly to this position; but there is no area of the curriculum that has not had its exponents for the problem method. In recent years the leaders in social studies education have made special efforts in their teacher preparation courses and through their in-service instruction to promote units and lessons which are centered upon problems and which promote critical thinking on the part of the student.[1]

Now, in spite of all this promotional work which certainly has been reinforced by psychological and sociological research findings, as one visits high school classrooms he sees only a most limited use of what truthfully can be identified as the problems approach. All teachers incorporate certain aspects of problem resolution into their instructional plans—at least on a few occasions during the year. However, very few go so far as to center their program in the problem type of organization or use problem solving as their major method of teaching.

If the problems approach is as important as so many writers have claimed, why has it "caught on" so slowly?

1) While great teachers from Socrates and Aristotle to the present have used problem solving, it is still essentially a "new" technique. John Dewey, in his book "How We Think," written in 1910, is often credited with having made the germinal statement concerning the use of reflective thinking as the central approach in our schools. No educational idea, despite its value, gets very far in fifty years; thus, problem solving is still rare because it is so recent as compared to most other entrenched educational approaches.

2) Teachers themselves hesitate to use an approach which they do not understand fully because they have had such little experience with it. Many instructors in our secondary schools have gone through their entire collegiate education without any real problem solving ventures. Because of the

* Associate Professor of Education, Stanford University.

[1] Anderson, H. R. (ed.), *Teaching Critical Thinking in the Social Studies*, Thirteenth Yearbook, National Council for the Social Studies, 1942; Fersh, G. L. (ed.), *The Problems Approach and the Social Studies*, Curriculum Bulletin No. 9, National Council for the Social Studies, 1955.

subject-centered training of many of these mentors, they feel that it is artificial to so organize the content of their courses.

3) In many cases there is little community understanding of what is involved in a real problem solving situation. Some adults hold a concept of education which leads them to believe that this technique is dangerous since it leads the pupil to question. Others feel that it is not the job of the school to so involve children in controversial, social questions; problem solving is not recognized as endemic in democratic education.

4) Some oppose attempts at problem solving, particularly in the earlier grades, because of pupil immaturity. They claim, "Why should the children struggle with problems that society itself is unable to resolve?" These critics do not seem to recognize that there are kinds and varying degrees of problems which are very real to boys and girls of every age level. While some adult problems are not always common to a given group of pupils, they usually become highly motivated once they perceive the relationship between themselves and the issue at hand. The achievements of slow learners as well as fast learners reveal the fallacy in this excuse for not using problem solving.

5) Certain instructors frankly do not recognize the need for instruction in the steps of problem solving. Either they believe that students pick these up in out-of-school aspects of their lives and in other courses, or they seem to reveal an implicit faith in the automatic transfer of learning and the "deep freeze" theory of education. In this latter case they believe that the skill evidently will result from the efforts pupils have gone through in memorizing content and that at some later date when the student is faced with the necessity of solving a problem this ability will automatically assert itself.

6) It is agreed that it is more difficult to use a problem centered approach in some classes than in others. While the problems approach allows for both a logical and a psychological arrangement of subject matter, as was indicated earlier, some instructors hesitate to use anything but a traditional and logical organization. The sad fact is that even in those courses where it is easiest to include problem solving, few instructors do a really adequate job. For example, too many science teachers have clung to the mistaken notion that problem solving abilities are by-products resulting from the learning of facts; this, in spite of the fact that every major report in the field of science education for the past quarter of a century has emphasized the importance of the problem solving objective.

7) The press of time, or should we say the instructors' unwillingness to give the necessary amount of time to problem solving learning experiences, is another reason that the method has not been adopted by great numbers of teachers. The preliminary discussion, the definition of the problem, the lengthy and time consuming research, the attempts to reach group consensus on procedures and conclusions, and the days involved in completing and following up on a problem situation are more than some teachers are willing to spend on a learning experience. Some of us remain

slaves to the courses of study; we must cover every item in our subject area. Or, unwilling to select in terms of pupil and social needs, we feel it is easiest to give them the answers and let it go at that. Such instructors do not recognize the importance of practice in building the skills of reflective thinking.

8) For most of us the textbooks, to a large extent, still determine the curriculum. Texts remain the center of our courses and certainly the great bulk of texts does little to promote the problems approach. While one writer[2] has suggested a set of most helpful steps by which a teacher can lead his pupils in the critical appraisal of their textbooks, most of us fail to go anywhere nearly far enough beyond the textbook in teaching our courses. Texts remain ends in themselves rather than sources of common reference and points of departure.

9) There is a real problem for many teachers in evaluating the outcomes of problem solving and the development of the competencies which mark the critical thinker. Evaluation for the bulk of instructors probably still consists mainly of testing the students' apprehension of a given set of facts. One important area of neglect in the training of teachers is the failure to give adequate emphasis to the techniques of subjective and objective evaluation. Also our typical systems of grading, passing, and accrediting are not in close harmony with the sort of evaluation that needs to mark problem solving situations. On top of this, the overburdened teacher cannot be expected in his "free" time to be able to give the necessary amount of attention to evolving the needed means for appraising pupil progress in this area of critical thinking.

While other reasons could be added to the above list they serve to explain why numerous teachers do so little with the problems approach. We will now attempt to outline just what a good problem solving situation entails. Misconceptions about what problem solving means may be a major reason why the approach has not been accepted more universally. In the light of the writer's experience with the method, while it is not the *one* educational panacea, he believes many difficulties, reported by teachers who have had failures with the approach or envisioned by teachers who fear to try the method, are not inherent in the process. These, rather, exist because of the manner in which the approach has been improperly applied or is misunderstood. Perhaps if these misconceptions are attacked negatively, the positive features of the problems approach will stand out clearly. At the same time, it will be possible to drop some warning hints about misuse and possibly interest a few more readers in attempting to apply this most rewarding technique. In each of the following examples, while an instructor may have helped promote critical thinking and may also have applied certain aspects of problem solving, is at least a partial failure to meet fully the criteria which are generally accepted as marking the problems approach.

[2] Goodson, Max R., "The Improvement of Pupil Thinking," *Educational Administration and Supervision*, November 1939, pp. 615–24.

1) *Problem solving is not studying about a problem.* In many Senior Problems courses the students merely read a textbook which topically covers a series of social, economic, and political problems. Even in lively class discussion of problems, the course and the procedure should not be dignified by the title "Problems."

2) *Problem solving is not the teacher answering or pre-solving the problem for the class.* While the teacher should be consulted by the pupils in the same way they would refer to another source of information, the instructor should be careful not to use his position of authority and leadership in such a way that the class is brought to believe that it must come to the same conclusion that the teacher holds.

3) *Problem solving is not "real" when the problems are not accepted by the pupils as their own.* There is often room for pupil choice in the selection of problems; but even when a problem may be dictated into the curriculum, legislatively, by the course of study, or through the teacher's recognition of the social import of the issue, the students need to be helped to see the purposefulness in the projected study by relating the problem to the students' own needs and interests. Certainly in the selection of problems, the background of the pupils, their maturity, and their previous experiences should be noted in the teacher's preplanning. It is true that some problems do not immediately loom before the pupils as their own, but the able teacher can usually guide the group to recognize the so-called adult or seemingly remote social problems as being the "other side of the same coin" containing their immediate and personal experiences.

4) *Problem solving is not successful when the majority of the problems studied are unsolvable.* If students are constantly required to work on great issues which society has never been able to solve and very likely will continue not to do so, one cannot expect the students to remain motivated for a very long time, and the method will deteriorate into just another stereotyped classroom technique.

Occasionally it is necessary to tackle some of the "unsolvable" affairs of mankind. Pupils will then come to grasp the basic fact that while we may have the necessary "know how" to solve some of our most serious problems, we have not found the means to alter attitudes so that we can make the needed changes.

5) *Problem solving will not be satisfactory if pupil action does not ensue after formation of the class plans for resolution of the issue.* Pupils will not apply themselves if they come to discover that no opportunities are allowed for them to follow up on their hypotheses. Certainly the teacher will also want to make the problem solving experience more purposeful by regularly leading the class to generalize on the results of their critical thinking activities. The social significance of the conclusions needs always to be considered and at this point there lies an excellent opportunity to contribute to student growth in ability to make value judgments.

6) *Problem solving often will not succeed because the group has failed to think and act carefully in terms of any one of the five steps of reflective*

thought. If definitions are not made clear and precise, if the problem is not stated correctly, if there is no firsthand gathering of information by the students, if only one-sided materials are used, if pupils are not given an opportunity to view conflicting hypotheses and to attempt to reach some sort of consensus, or if students are allowed to rationalize away the facts, problem solving tends to bog down or students fail to arrive at any honest or satisfactory conclusion.

7) *Problem solving cannot be termed adequate when the solution agreed upon is likely to lead to a greater problem or problems or if it is unacceptable to a large group.* It is very necessary that the suggested means of problem resolution comes very close to solving the basic causes, and not the superficial evidences, of the problem. Equally important at this point is the gaining of a proposed solution which each student is willing to have applied to himself if need be.

Each day all of us are faced with a number of important problems. These are "solved" in a great variety of ways. We may act upon a hunch, flip a coin, or if the problem proves too difficult we may substitute, alter, or give up our goal entirely. The results are often most unsatisfactory and we only succeed in putting off the eventual "day of reckoning." Many of our problems are also solved by authoritative decree, by majority decision without consideration of minority views, by unhappy compromise, or glandularly, in terms of our emotions, instead of our reason. As we observe the myriad of issues besetting our civilization, how can we continue to overlook an educational method which holds high promise for evolving the type of individual and citizen most adequate to meet the challenges of our times?

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Teaching Critical Thinking and Problem Solving in the Junior High School

By DON C. CLINE*

Pupils entering junior high school are beginning not only a new phase of school life, but are also entering a new phase of living. During the three years they spend with us, they change greatly. Their childish curiosity is deepened to question life as they know it and to question life's meaning for them. In their desire to become more independent in thought and action, they constantly seek more information; the innocent "why" of earlier years becomes a searching, probing, and even demanding urge for more facts. During this period pupils begin to enjoy some success in their desire for independence; they grow in their ability to stand on their own feet and to make their own decisions; they increase their skill in assimilating the standards, values, concepts, and ideas of adults; they grow in their skill in making judgments; and they begin to assert themselves with ideas and conclusions that are their very own. At the end of these three years, the wide-eyed, naïve seventh grader emerges as a young adult.

The kind of adult this youngster is becoming depends, of course, upon the experiences which have taught him, upon the guidance and direction given to his learning activities, and above all, upon his ability to think clearly and critically about himself and his immediate world. Herein lies a two-fold responsibility of teachers of junior high school pupils—especially of teachers of the social studies. This responsibility is to provide experiences which encourage thinking and which in time develop skill in the processes of crtical thinking. It is a responsibility which aims to teach concepts, understandings, and values which build foundations for thoughtful action and which lead to conclusions, decisions, judgments, and choices based on carefully selected facts. To meet this responsibility, junior high school teachers have had to distinguish between theory and practical application. Those who are successful have had to recognize, first of all, that often social studies content in the junior high school does not provide "real" problems for solution. Problems worthy of the name are only those problems which are "real" to the pupil, which relate directly to him and to the world in which he lives. These teachers must accept the fact, too, that critical thinking involves a number of complex thinking skills found only in the more mature mind, and so they direct their attention primarily to developing the simpler skills in critical thinking.

Any practical program of instruction in the junior high school de-

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signed to promote skill in thinking, and eventually to increase skill in the critical thinking which is necessary to problem solving, must be affected by several other factors which are becoming more and more apparent to teachers concerned with teaching pupils to think. Among these are:

1. *Thinking requires effort.* Successful teachers help pupils understand that they will grow in their ability to think only by *consciously* working at the various skills involved in thinking.
2. *Learning depends upon background and understanding.* Teachers who expect pupils to grow in their ability to think, for example, help them understand why it is important to think, what processes are involved in thinking, what steps are necessary to reaching a conclusion, and all other factors involved in using the thinking skills that teachers expect them to develop. They are alert to point out the skill to pupils as they are using them because, unless they know and understand as much as they can about what they are doing, they will not grow fully in their ability to think.
3. *Pupils must be taken at whatever level of maturity or skill in thinking that they have reached and carried forward as far as their ability and background for thinking will permit.* Sometimes teachers work at only one or two of the skills important to critical thinking and problem solving, depending upon later experiences in school to carry pupils forward to the next step.
4. *Skill in thinking depends upon maturity as well as mental ability.* Emotional immaturity is often as great a handicap to growth in the thinking skills as mental limitation can be.
5. *Pupils grow in their powers of thought only if they are given an opportunity to practice the skills they are strengthening and developing.* Pupils must be provided with an ongoing program of training presenting new experiences in thinking which are of increasing difficulty.
6. *Thoughts and ideas are personal.* Teachers who are developing skill in thinking accept the ideas of pupils even though they aren't always the ones they wish to hear. They respect pupils for the thinking they do and make room for all divergencies in thought and opinion within a given class.
7. *Training in clear and critical thinking is not an experience reserved for the "gifted" or more able pupils.* Thinking is the responsibility of all pupils. The less able pupil will someday be an adult who must make decisions, use sound judgment, make choices and plan a course of action determined by thought. He may not be capable of developing facility in the more complex processes of thinking, but the less able pupil has a kind of "common sense thinking" which teachers recognize, develop, and guide. Then he has a workable tool for solving problems which he will face.

8. *The teacher who best develops skill in thinking and growth in the ability to solve problems is one who is an example of success in the use of such skill himself.* He demonstrates this skill in his teaching methods and in his relationships with his pupils and with other adults. In short, he practices what he teaches!
9. *Finally, teaching critical thinking or providing experiences in any kind of thinking is most successful when such teaching is simple, honest, and straightforward.* "Gimmicks" and artificial activities are not necessary.

We all know that pupils must think before they can learn to think critically. In junior high school the first responsibility is to provide experiences which stimulate and encourage thinking. A very simple and effective technique practiced by many teachers is the use of daily key questions written on the blackboard. Such questions might be labeled "Things to Learn" or "Things to Think About Today." These questions are few in number; a couple may relate directly to the facts to be found in textbook study, for instance, and one at least involves the pupil further by asking him to use the facts learned that day to reach a conclusion not directly presented by the material in the book. In a B7 geography unit on Mediterranean Europe, for example, a teacher might have the following questions on the blackboard:

1. What words best describe the climate of the Mediterranean countries?
2. How does this climate influence the choice of crops raised by people living in Spain, southern France, Italy, and Greece?
3. How has the climate of southern California made similar choices necessary? (The third question involves an understanding of the facts learned in the day's lesson, the use of facts previously learned, and the use of the pupil's own experiences and observations. This third question is in essence a simple application of critical thinking. Teachers who use this technique daily are promoting thinking skill. Moreover, they are setting up an opportunity for evaluating each day what has been learned and thought. They use their key questions at the end of the period along with those that arise during class discussion to sum up the day's learning and thinking.)

Junior high school teachers who are developing skill in thinking with their pupils let the youngsters know *why* they are doing a particular unit or piece of work. The use of daily key questions is just one phase of this responsibility. Presenting semester or unit overviews is another phase. Using time lines and charts to point out relationships and to show cause and effect is still another. A teacher of A9's in a course in modern history, for example, draws upon current nationalist uprisings, events in the cold war, experiments in automation to make "real" the threads of nationalism, democracy, science, and industry around which he intends to build his

course. In so doing he is providing some "why's" for the semester's work, and these "why's" are based on events which are a part of his pupil's daily lives. Later on, when he begins a unit on the advances made in democracy by the British, American, and French revolutions, he first examines with his pupils the freedoms which they themselves understand and appreciate. He then turns to a time-line to recall with them the foundations for progress in democracy to be found in the Middle Ages and the Renaissance, units studied in the preceding semester. Now he is helping them see relationships, pointing out causes and effect. He is also building background to stimulate more mature thinking and to promote easier assimilation of more mature ideas.

Another way in which junior high school teachers promote thinking is by developing effective use of the textbook as a learning tool. They introduce a new chapter by having pupils study the title of the chapter. They have pupils ask themselves, "Why does the chapter have this particular title? What facts might I expect to find under this heading? How will a chapter with this title carry us forward in our study?" Questioning the title in this manner leads to a whole list of possible ideas that reading the chapter may uncover. These anticipations, when they are phrased as questions, become guides to more thoughtful reading; they are another step toward skill in thinking. Next, pupils can use the same kind of inquiry in questioning the promise given by the subtopics or other chapter divisions. Teachers who insist upon this kind of analysis are helping pupils become thoughtful readers and are developing a kind of intellectual curiosity important to thinking about anything. The more advanced stages of this experience lead to library research and to the use of multiple texts for comparison of ideas or for checking validity and the gathering of additional information.

Teachers who are doing the best job in developing the skills necessary to critical thinking make particular use of group discussion. They list facts drawn from individuals in the class on the blackboard. They help pupils see how these facts lead to logical conclusions. In leading discussion, they challenge pupils to back up their opinions with facts. They develop a skill in asking questions that keeps the discussion moving with direction. They use "how" and "why" questions far more than those which ask "who" or "what." They seize upon ideas and suggestions volunteered by pupils to raise more questions. They encourage the pupils to ask questions. They arouse curiosity. Above all they arrive at conclusions and in the process, they take their pupils through the steps of logical, clear-cut thinking.

Opportunities to practice the thinking skill developed are given to pupils not only in discussion periods, but also in tests. Teachers have come to recognize the importance of the essay test in stimulating thinking. Teachers of junior high school social studies who use such tests make plans to teach pupils how to answer the questions in such tests thoughtfully. Some prepare them for future essay questions by giving them a topic sentence and asking them to use it as a first sentence in a paragraph, completing the

paragraph by adding the related details. This has been done very successfully by some teachers who have the whole class develop such a paragraph on the blackboard.

The advantage of providing this thinking practice is apparent. The teacher can point out the steps involved in selecting the correct details and relating them to the main idea of the topic sentence more easily when everyone is thinking togther on the same subject. "India is a land of contrasts," "The decline of feudalism and the rise of towns and cities strengthened the business classes," "Smog in Los Angeles is the result of geography as well as of other factors," and "The United States won vast territories by purchase, settlement, and war" are examples of such topic sentences. Pupils working with these or similar ideas must draw upon their learnings and select facts which relate directly to the idea suggested, choosing those which suit their purpose best and arranging them so that they develop the idea clearly. This is an experience in thinking. The skill they learn they can then use to answer essay type questions which may ask "Why is India called a land of contrasts?" "How did the decline of feudalism and the rise of towns and cities affect the business classes?" In either case they are working with facts and ideas and they are learning to think clearly and directly toward a conclusion.

Teachers take from history the problems faced by peoples of the past and provide experiences which serve to strengthen pupil understanding of the processes in critical thinking. The eighth grade teacher who explores the various motives which lead people west across the nation, who investigates the hardships of settling in a strange new land and building organized communities, analyzes with his pupils the courses of action open to pioneers. He develops an understanding of the relationships between events in the east and developments throughout the country at that time. He helps pupils understand the problems of the settlers and how they settled them. All of history is rich in such problems. They aren't "real" to the pupils, but they do promote experience in problem solving. The investigations, analyses, and discoveries of cause and effect in the solutions of these problems provide valuable training in basic thinking skills.

The "real" problems of junior high school pupils, of course are their personal problems. Boys and girls who ask "Why don't I get better grades?", "How can I convince my parents that I can take care of myself?", "Why do *I* have to learn about county government?", "Why don't I get invited to parties?" and similar questions have "real" problems which need solving. The social studies teacher who is teaching skill in thinking helps his pupils face these problems, too. He helps them analyze them in the light of known facts, search for other facts, and through careful guidance gets them to call into play the skills in thinking, investigating, withholding judgment, and making choices. At this point, in this personal relationship, he is doing his best job in teaching the skills necessary to critical thinking and problem solving. He is showing them how to use the skills in thinking in a very vital way. The teachers who are showing pupils

the relationships between the classroom experiences they arrange and the everyday lives of their pupils are succeeding in their responsibility.

There are other major ways in which junior high school social studies teachers are doing a good job in teaching boys and girls to think. One is to give pupils an opportunity to participate in planning, in the making of choices. Teachers who make plans for this experience are helping pupils understand the importance of thoughtful choices by making them live by the results of such choices. Planning includes evaluation of results and involves setting up standards and criteria for this evaluation. Thus pupils are being given a chance to grow in their ability to make sound judgments. Another is to provide opportunities for pupils to grow in the study skills which help to organize facts logically. Teachers are teaching outlining as a means of organizing ideas to point to certain conclusions. They are showing pupils how to prepare a summary which organizes facts into paragraphs dealing with one specific idea. Moreover, since thinking is something people can do when they are alone, teachers give pupils "quiet times" in class for thinking and reflecting. This kind of experience helps youngsters appreciate the value of "time to think" by giving them something to think about. Such training can do much to help them realize that time when they find themselves alone can be profitably spent in thinking and that it is during such thoughtful moments that they can discover solutions to their own problems.

All of these things the teacher of junior high school social studies does consciously through careful planning. He does not make the teaching of thinking incidental in his plans. He may not have his pupils involved in the more complex experiences of critical thinking and problem solving, but he is teaching them *how* to think, giving them a *chance* to think and grow in thinking skills. He is preparing them for more advanced thinking and thought processes which may be necessary to them in later years. This, perhaps, is the most important role of the junior high school teacher of social studies—doing the spadework in the field of simple, step-by-step thinking, paving the way for the more complex thinking skills involved in critical thinking and problem solving to be taught by the senior high school teacher.

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Teaching Critical Thinking in Secondary Social Studies

By JOHN E. SEARLES*

The social studies teacher has a unique function in teaching critical thinking. It is in his classes that critical thinking becomes part of the subject matter—that is to say, it is in the social studies that the thought processes are examined as a part of human behavior. The teacher is giving an invaluable tool to the future when he trains a pupil to think clearly.

The teacher must remember two things about this process. One is that the pupil must think critically *about* something; the other is that it must be practiced more than it is preached.

To say that there must be critical thinking about something is axiomatic. Just to think critically about nothing at all or about something having little significance is a sterile process. It becomes an exercise in intellectual gymnastics. There are some implications in this for the social studies teacher. First of all, he himself must be capable of critical thinking. Second, he must realize and help his pupils understand that learning to think critically is a long process requiring step-by-step progress. And third, the teacher should use the subject matter he is teaching to develop critical thinking.

The secondary school teacher may accent the method more than the result. Often a junior high school social studies class will resolve itself into brief periods of almost Socratic dialog in which the teacher accents the method by constantly asking the pupil to define the problem, cite his sources, and support his conclusions.

One senior high school social problems class is organized in such a way that three days a week pupils discuss social problems they have selected. This discussion is based on reading notes the pupils have assembled for the problem. Their statements are based on conclusions reached after getting evidence. They are opinions based upon facts. The class opens with the teacher, or a pupil, defining the problem. Pupils selected at random are asked to give their conclusions. As each one presents his ideas, they are examined in the light of new facts presented by other pupils, and group conclusions are reached.

All talk about teaching critical thinking is, of course, predicated on the fact that the teacher himself is capable of critical thinking and understands the processes involved. The teacher helps his pupils to recognize and define the problem. He helps them to define the hypotheses.

"What do you think?" is a time-honored response to a pupil's question.

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It forces him to establish hypotheses. It gives him a sense of direction as he progresses to the next step—that of gathering and weighing information.

"Look it up," says the teacher.
"What are the facts?" asks the teacher.
"Here are some facts; weigh them with what you already know," requests the teacher.

With tactics such as these the teacher is helping his pupils to build an apperceptive mass, the background from which valid conclusions can be drawn.

"That's one possibility," says the teacher.
"That is a good point," praises the teacher.
"Are you sure?" asks the teacher.
"Does that pertain to the problem?" challenges the teacher.

Thus, constant pressure is put on the pupil to base his opinion on fact and to be sure that the facts are pertinent.

Another way to teach critical thinking which will not be enlarged upon in this article is to organize the course around problems. Perhaps the main weakness of this method is the tendency on the part of some teachers to allow their pupils to skim the surface. Too often, unskilled attempts to proceed from the standpoint of pupil needs can become mere catering to pupil desires.

All of this may seem to be a large order. To the teacher who is concerned with "covering the content," it will appear to take too much time. To the teacher who has broader objectives, teaching critical thinking will be worth doing. There is real reward in seeing a young mind burn with a clear flame rather than sputter in a smoke screen of confusion.

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Education for Problem Solving in High School Science

By ROBERT STOLLBERG*

The content of these pages is based on a pattern of three assumptions concerning the role of problem solving in American education:

a. The term *problem solving* corresponds roughly to such expressions as "scientific method and attitude" and "critical or reflective thinking." It refers not only to scientific and quantitative matters, but also to the never-ending array of daily-life problems—personal difficulties, group decisions, and social issues. In clumsy but straightforward terms, problem solving can be thought of as "finding out what one wants to know and making effective use of that knowledge.[1]

b. Competency in problem solving stands as a primary objective of education for all boys and girls in American schools.[2] Science teachers have an extremely important, although by no means an exclusive, role to play toward this end.

c. Problem solving ability involves a network of attitudes, skills, and knowledge. Students learn problem solving best through personal and meaningful experiences related to problem solving—*i.e.*, by *solving problems.* True, learning by precept and by example have their role in this phase of education as in so many others. But as in other areas, the most effective means of learning is through direct, purposeful participation—*learning by doing.*[3]

Within the writer's experience, the most effective examples of learning problem solving may be grouped under the general heading of "problem-project" methods of education. This phase is interpreted in a wide variety of ways by different teachers. For example, some science classes undertake units of work stated as questions, or laboratory exercises posed in the form of problems. Merely putting question marks at the end of assignments does not transform them into problem solving situations. Again,

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[1] The February 1956 issue of *The Science Teacher* has as its theme "Problem Solving—How We Learn." This will stand as a build-up to the forthcoming national convention of the National Science Teachers Association, March 14–17 in Washington, D.C. The entire convention program is devoted to this same theme.

[2] Dressel, Paul L. "Critical Thinking—the Goal of Education"—N.E.A. Journal, October 1955, pp. 418–21—defends this point of view vigorously.

[3] See also Jackson, William N. "Reflective Thinking as a Purpose in High School Science"—*The Science Teacher,* November 1955, pp. 273–76.

"problems" may all be quantitative in character, they may all come from the text or the teacher, or they may be exclusively confined to the field of science. Such examples of problem-project teaching lack imagination and they lack effectiveness.

Some characteristics of problem-project methods of science teaching at their best are:

1) Problems frequently emerge from class discussion, current events and community affairs, and individual interests of students.

2) Projects may be undertaken by individuals, by small groups, or by an entire class.

3) Project activities may be short-lived or they may last many weeks.

4) Not all students undertake the same projects nor do them at the same time. They may be done in classroom or laboratory situations, or in other areas of the school. Considerable problem-project activity may be done in out-of-class time—often at home or elsewhere in the community.

5) Effective problem situations seek information which is not readily available in books or similar references. That is, they seek information which someone really *wants to know*.

6) Problem solving activities include not only laboratory manipulation, but also natural history observation, reading and listening, writing and speaking. To paraphrase a great scientist's words, problem solving is simply doing one's best with all the techniques available—no holds barred.

7) Problem-project activities often involve other "subject" areas such as mathematics, social studies, etc.

A consideration of the above reveals many of the sources of strength of the problem-project approach to science teaching, particularly insofar as problem solving is a primary objective of science education. For example:

a. Problems originating as in (1) and (5) are real and they are timely; they have intrinsic interest for students and hence have the advantage of "automatic motivation."

b. Project activities carried out as in (2) may involve experiences in group planning, sharing of responsibilities, and in general, getting along with others.

c. Activities organized as in (2), (3), and (4) permit wide flexibility and individualization of learning experience. Since not all students undertake the same activities, there is a natural need for sharing of ideas among groups. This is truly functional reporting.[4]

[4] See also Stollberg, Robert "Learning in the Laboratory" *Science in Secondary Schools Today*, Bulletin of the National Association of Secondary School Principals, January 1953, pp. 100–10.

d. Activities of the scope and variety suggested in (6) provide learning experiences in the full range of communication techniques, both linguistic and mathematical.

e. Problem-project activities which involve science and other areas of the curriculum are conducive to effective integration of learning.

When students become involved in the pursuit of a project they almost inevitably encounter a pattern of obstacles, such as lack of necessary knowledge, skills, or materials. These needs in turn become problem solving situations of the most genuine sort. Students have the experience of *recognizing* these problems, *seeking* their solutions, and *acting* on the basis of their findings. These obstacles, then, provide ideally natural, true-to-life challenges for problem solving. In terms of problem solving education, this frequently unheralded feature of problem-project teaching may be its outstanding source of strength.

Some brief examples of this kind of problem solving education in action may serve to illuminate the ideas delineated above.[5]

a. A portion of class or laboratory time (perhaps a period or two a week for much of the term) is devoted to individual/group projects. Students are expected to be involved in some project or projects throughout this special period. They may work individually or in groups. The activities are to be reasonably related to the subject with which the course is concerned. Students are discouraged from the extremes of projects so large that they endure for an entire semester, or projects so small that they last only a week.

A standing assignment is the weekly submission of project reports to the teacher. These are informal and brief. They correspond in a real sense to the periodic reports that bread-and-butter laboratory scientists turn in to their research co-ordinators. In these reports students (individually or in groups) identify their projects, explain their origin and importance, outline the objectives of their investigation, propose their method of operation, discuss obstacles encountered or anticipated, describe progress and results (or lack of same), and evaluate their own enterprise. This cumulative record serves to help the teacher keep tab on the varied activities of his students so he can provide stimulation or restraint, advice or information, as needed. These weekly statements also may constitute a very realistic "laboratory or project report."

During the course of these several projects, students may wish to seek information discussion-wise from their fellows, or lecture-wise from their instructor. Many of the projects may have as their culminating feature an informational report to the class as a whole.

[5] These examples are generalized and adapted from the experience and observations of the writer and his colleagues; hence no specific reference is given. Additional examples may be found in two related publications, "Selected Science Teaching Ideas of 1952" and "Science Teaching Ideas, II" (1955). Both may be obtained from the National Science Teachers Association, 1201 16th St., N.W. Washington, D.C.

This may be oral or written, verbal or graphic, or in whatever form provides effective communication. This again constitutes truly functional laboratory reporting.

b. A junior high school class has somehow been stimulated to acquire a Japanese miniature garden (Ming tree). Limited funds are available. Rather than simply buy the product from a local supplier, the group is encouraged to secure it directly from Japan!

This project involves letter writing, location of sources of materials, direct contact through correspondence with citizens of a foreign land, acquaintance with inter-continental postal rates, finding out about monetary problems involved between two systems of currency, and understanding instructions concerning the product acquired. The enterprise lends itself to the formation of several sub-committees within the class. Planning within and among these groups is essential. The project involves related learnings outside the field of science, including mathematics, social studies, language arts, and creative arts. All in all, the situation provides abundant opportunities for problem solving experiences of the most effective variety.

c. A student in a physics class is puzzled by the statement in the text that water always swirls in one direction down a drain in the northern hemisphere. Since no one, including the teacher, can corroborate this by personal experience or knowledge, a group experiment is proposed. Each student agrees to inspect water draining from a variety of tubs, bowls, and sinks in his own home and to report his observations to the class. The following day over 150 pieces of data are assembled. This example of whole-class planning and problem solving is of short duration, but it provides the basis for most interesting tentative conclusions and a springboard for further investigation.

It is not the intention of the writer to suggest that problem-project activities of the kind described here should constitute the only weapon in the science teacher's educational arsenal. There is also much need for effective use of other teaching-learning activities, both traditional and novel. Indeed, the problem-project approach often leads to students' conviction that they need more background information. This may result in a return to "class-work and book-learning"—this time with a purpose genuinely felt by students, not merely imposed by the teacher.

The use of problem-project approaches to learning makes it possible to improve student achievement not only in problem solving ability, but of "subject matter" and "essential skills" as well. To the extent that we as teachers can increase our skill in this pattern of teaching, we can more effectively meet our obligations to our students and to the society in which we live.